



Oysters are important shell fish, and are obtained from special rivers in which the industry of cultivating them has been developed. Colchester and Whitstable in the Thames estuary, the shores of Brittany in France, and Chesapeake Bay in U.S.A. are noted for their oysters.

Lobsters and crabs are other shell fish, and these are caught off the south coast of England, Eastern Canada, etc.

**Trade in Fish.** All fish are very perishable when once removed from the water, and special precautions must be taken to ensure a plentiful supply of fresh fish to centres of population. It is necessary that shops should receive their supplies very soon after the fish are caught. The usual plan is for fish to be packed in broken ice immediately it is caught, to be taken quickly to port, and then dispatched by rail to the centre where it is required. London is supplied mainly from Billingsgate market, which is situated on the banks of the Thames, to which fishing boats can bring their catch. Grimsby and other fishing ports have good railway communication for the rapid movement of fish.

Much fish is exported from our ports to the Continent of Europe, where it is a more important food than in England. It is usually sent away salted, dried, or cured, by which means it can be taken long distances and remain in a sound condition. Fish is an important food in the Catholic countries of Europe. We are quite familiar with smoked haddock, kippers and bloaters (cured herrings), and know that they do not become unfit for food so quickly as fresh haddocks and herrings.

Salmon, pilchards, and sardines are usually tinned, and are thus kept fresh for an indefinite time.

**Fishing Peoples.** Study Fig. 98 and you will notice that the peoples having access to the North Sea fisheries and the fishing grounds near Newfoundland have a large production of fish. Notice, also, that Japan, with her long coast and easy access to the

# WORLD GEOGRAPHY

## BOOK III COMMERCIAL GEOGRAPHY

BY

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ENGLISH COMPOSITION, ARITHMETIC, 'ETC'

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in England. **Wigan** is the coal-mining and iron-smelting town, and an important railway junction on the edge of the moors; other noted towns are **Burnley**, **Accrington**, **Blackburn**, **Bolton**, **Bury**, **Rochdale**, **Oldham**, **Ashton**, and **Stockport**.

Beside spinning and weaving, there are factories for dyeing and printing. All these processes carried on in factories need machinery, so that machine-making is a highly important industry also. Textile goods are sometimes bleached to bring them to a pure white colour. The bleaching material is made by the chemist, and when used for cotton and linen is prepared from lime and chlorine. Lime is manufactured by heating chalk, and chlorine is prepared from sulphuric acid and salt. Bleaching is an essential operation in the manufacture of cotton, and it is an advantage if the necessary materials are made near the textile centres. The salt of Cheshire is the great raw material for the chemical industry in the adjacent area of S. Lancashire, where the cotton goods are made.

**Dyes** were formerly made from the cochineal insect, or from the saps of plants such as gamboge, indigo, logwood, and fustic. To-day they are mostly made by the chemist from coal tar, which is a by-product obtained in the manufacture of gas from coal. Dyes of almost every hue can be obtained.

**Wool.** We have already noticed, when reading of the Grasslands of the World, the countries which are noted especially for sheep-rearing—Australia, U.S.A., Argentina, S. Africa and New Zealand. The best known breed of sheep is the merino, which was first reared in N. Africa and in Spain. This sheep yields the best wool, but does not provide good mutton. Other varieties, such as many of the English breeds, give the best mutton but yield less wool. It has been the custom on the great sheep runs of the world to rear cross-bred sheep, so as to obtain both good mutton and good wool.

Europe is still the chief wool-producing continent, but as most of it is used in the home factories, there is little for export. England



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## Notes.

**Waste Material.** In the textile industries a large amount of waste material is obtained, and uses have been found for this in order to avoid loss. In the cotton industry, *cotton wool* is made from material unsuitable for spinning and weaving. Short lengths of yarn are made into *cotton waste*, which is used by engineers as swabs. Waste from weaving is also pulped and used in the manufacture of *paper*. Waste wool is often made into *fell*, or used in the manufacture of *shoddy* by a mixture with good yarn for the making of cheap clothing.

**Coal Tar**, a black, oily liquid obtained in the manufacture of gas from coal. At one time it was considered to be worthless, but it is now the source from which aniline dyes and many other useful products are obtained.

**Cochineal**, a brilliant scarlet dye obtained from a scale insect which feeds on several varieties of cactus. About 70,000 of the insects are required to make a pound of cochineal. When the insects are scraped into bags, boiled, dried and powdered they yield a bright crimson dye-stuff which was formerly much used in the dyeing of textiles. Chemical dyes now take its place for dyeing woollens, and cochineal is mainly employed in colouring confectionery.

**Chlorine**, a greenish-yellow gas obtained by chemists from common salt. Useful for bleaching and as a disinfectant.

**Mercerisation**, a chemical process by which cotton is given a silky sheen, is named after John Mercer, an English dye chemist (1791-1866).

## Exercises.

1. State reasons why S. Lancashire has become the world's chief centre of the cotton manufacturing industry.
2. From what countries and by what routes are supplies of raw cotton conveyed to Lancashire?
3. What special importance have the railways that cross the Pennines from S. Lancashire to the W. Riding of Yorkshire?
4. What are the advantages and disadvantages of the cotton manufacturing industry being situated at Bombay?
5. What do you understand by specialising in an industry? Give examples.
6. State reasons why the W. Riding of Yorkshire is noted for the woollen manufacturing industry.
7. From what countries and by what routes are supplies of raw wool conveyed to Yorkshire?
8. Explain the map, Fig. 129, and the illustration, Fig. 127.
9. Explain the diagrams, Figs. 128 and 130.

## PREFACE

THE main object of these text-books on World Geography is to supply the junior student with reliable, informative and interesting accounts of (a) the interdependence of physical configuration, climatic conditions and natural products on the life of men in the world, and (b) the mutual dependence of countries on each other for the necessities of trade and existence

Each book is complete in itself, but together they will form a most useful three years' course of study for pupils in Upper Classes of Elementary Schools, Central Schools, and Junior Forms in Secondary Schools

This book is fully illustrated with maps, diagrams and pictures, the latter having been specially drawn from photographs, so that the details shall be clear and the pictures helpful

The matter is generally dealt with on a broad regional basis, so that the student will readily be able to grasp the main principles underlying the study of geography and to retain essential facts

At the end of each chapter notes have been added where necessary for the elucidation of points that might otherwise be obscure, and many exercises are included which will be of assistance to the teacher, and a means of self-testing by the student of his individual work

The writer is indebted to E. R. Shearmur, B.Sc., for his valuable assistance in preparing this book

B.—The spelling of the geographical names is in accordance with the lists issued by the *Permanent Committee on Geographical Names*, and published by the Royal Geographical Society

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## CHAPTER I

### EARLY TRADE AND TRADERS 1

A GLANCE at a map of the world in the middle of the book shows that the land masses and the oceans have been explored to such an extent as to give a fairly complete knowledge of the whole world. There are no new lands to discover and explore, and the physical features, climates, productions, and peoples of the world have been investigated and classified. The oceans have also received the attention of the explorer, and they can now be navigated with safety.

Although we have historical knowledge of man as an inhabitant of the earth for some five or six thousand years, the outline of the whole world has only been known for a few centuries, and it is in our own time that accurate knowledge has been gained.

In early times people knew only their own little area, and knew nothing of other regions except by hearsay. With the present wonderful system of communications knitting the world into one great area, we find it difficult to realise the conditions of early times, but primitive peoples certainly lacked most of the things that we possess and consider essential. In out of the way areas of the world, such as in the heart of the tropical forests of South America and Central Africa, primitive men are still known to exist. They live solely on the produce of their own region, shun intercourse with strangers, and wander about seeking the bare necessities of life.

**Need for Water.** Man's greatest need is water for himself and for his animals, life is impossible unless regular supplies of water can

be obtained This has been true throughout the history of man on the earth, and primitive man was forced to live near rivers, springs, wells, and water holes The location of supplies of water determined the routes along which he travelled in journeys for conquest and for trade In the undeveloped regions of the world this is true to-day The people who journey across the deserts pass from oasis to oasis, at which spots both water and food can be obtained

Modern man has the same need for water, but it can now be conveyed to him through pipes, and he is no longer forced to live near the springs or wells Birmingham, in the heart of England, has its water conveyed by pipes from a rainy area near the source of the Wye, in Wales, Coolgardie, a gold-mining centre in the dry region of Australia, has its water carried by pipes hundreds of miles from a rainy region near Perth, and any area can be similarly supplied with water, if development is found to be necessary

**Birth of Towns** The need for water caused the development of many early towns near springs and wells, as before the distribution of water by underground pipes was introduced man was forced to make his dwelling place near natural supplies of water But water alone will not support life, and other points had often to be considered in determining the site of man's dwelling place As a rule, we may say that any healthy spot providing water and food, and also offering protection from danger, would be suitable for settlement The tropical forests, most unhealthy areas, remain unpeopled to the present day, the deserts lacking water and food are practically devoid of people, but those parts of the earth in which nature has been bountiful are now marked by the works of man and by the presence of towns

The unsettled conditions which prevailed in early times often compelled man to choose the site of his dwelling place with the idea

of being safe from his enemies. Thus Paris and Venice each began on small islands with a water boundary. Edinburgh, Rome, Athens, and Stirling were founded on hills difficult of access to the army of an enemy and commanding a view of the surrounding country.

Durham, Canterbury, and Ely grew up in spots where protection was afforded by a religious body living in a monastery, for such

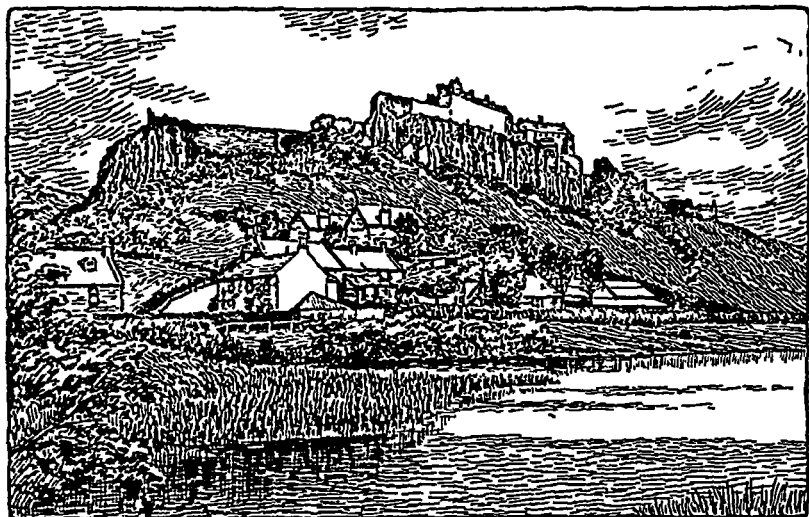


FIG 1—STIRLING CASTLE FROM RAPLOCH

This castle, once fortified, stands on an eminence in the middle of a plain, and commands the main routes to the Highlands of Scotland

places were not usually molested even in war time. Colchester, Chester, and Winchester developed at spots where fortified camps were built, as centres from which the military could control the surrounding country. In each case, security gave peace, and led to progress and development.

The sea, with its supplies of fish, and its use as a route, accounts for the birth and development of numerous towns at suitable places on the coastlands of countries. It should be noticed that most

of the largest cities of the world have developed on coastlands, and the cities have grown great by using sea routes for trade. Such cities are London, Glasgow, Liverpool, New York, Calcutta, Hamburg, Marseilles.

**Market Towns.** A market town should be able to deal with material in great variety and in large quantity, and should be able to attract to itself a large number of customers. Goods and

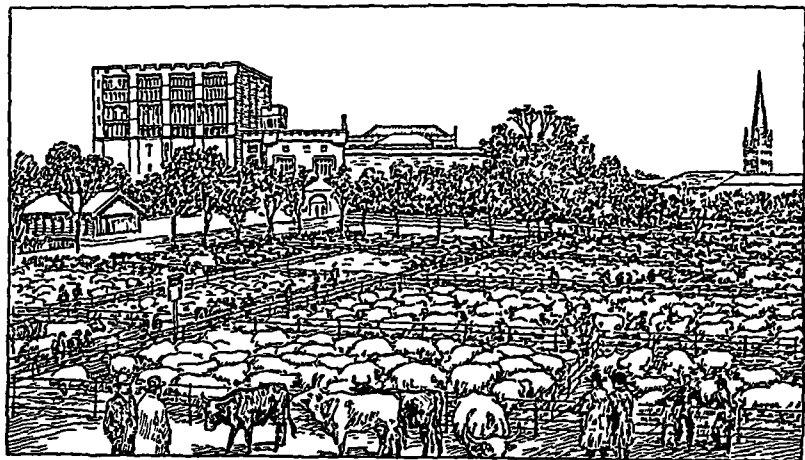


FIG 2—NORWICH CASTLE AND CATTLE MARKET

customers can only reach a market centre by means of routes, and the better a market is served by routes, the more will it be able to flourish. Routes are to a large degree determined by the nature of the surface, and the successful trading town is located in some spot which is the most easily reached. If you think for a moment of some market town with which you are acquainted, you will probably find that it is a centre of several important roads, that a river, or canal, or both pass through it, that railways join it with other towns, and tramways and 'buses help in taking the people quickly from place to place. Fig 3 shows the position of



Dorking, at which several routes meet in passing through a gap in the chalk hills south of the Thames. Such gap towns are very common, and, in England, include Luton, Leeds, Oxford, Maidstone, etc. Note the gap towns on Fig 4.

The early market towns were of great importance, and large cities such as Leicester, Manchester, York, and Lincoln have developed

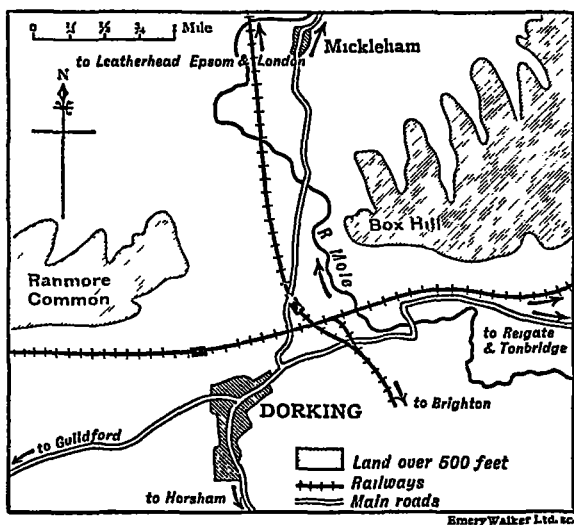


FIG 3 —THE POSITION OF DORKING

Note how the road, railway and river pass through the hill gap

from early markets. In many old market towns, market day is still preserved as a time for the gathering together of people for trade, more particularly trade in horses, cattle, sheep, pigs, poultry, butter, cheese, eggs, grain, and vegetables.

**Fairs.** Many towns are noted for their periodic fairs, e.g. Leipzig and Frankfurt in Germany, Nijni Novgorod\* in Russia, Bergamo in Italy, Stourbridge in England, and Allahabad in India. At one time it was a general practice to carry on trade in certain districts

\* Nijni Novgorod is now Gorky



by means of periodic fairs. A fair was like a big market, but people gathered there from greater distances. The purpose of a fair was to supply goods which could not be bought at the ordinary market. In England, such goods as French and Spanish wines, Italian silks and velvets, Flanders cloth, and iron, copper, and furs from the Baltic ports, could not be bought at shops in medieval times except, perhaps, in London, hence the need for periodic fairs. Buyers and sellers came not only from all parts of England, but from distant lands. The old Winchester fair lasted for sixteen days, that of Stourbridge lasted a month. Wooden shops were placed in rows like streets, and here were the toy-merchants, hatters, clothiers, china-merchants, cheesemongers, furriers, diamond-merchants, and many others. Though fairs are still held in some places, they are of much less importance than they were, now that goods can be readily conveyed to all parts of the country by road, rail, and water. Exhibitions, such as the British Empire Exhibition at Glasgow in 1938, to some extent take the place of fairs.

**Route Centres.** Any points to which routes naturally converge are called route centres or nodal points. Good examples are towns at the limit of ocean navigation of rivers, that is, the farthest point to which ocean vessels can reach. Such towns are London, Glasgow, and Hamburg, where land and sea routes meet. A gap town such as Guildford, Dorking, Luton, or Leeds is usually the largest town of its area. A town situated at the entrance to a strait must be a route centre, and towns in such positions, like Gibraltar, Aden, and Singapore, are always important. Nodal points are suitable for good development, inasmuch as they are the natural meeting places of routes, and are thus favourably situated for trade. Notice the important position of Singapore shown on the map in the middle of the book. It is the meeting point of all sea routes linking the Indian and Pacific Oceans.

## Notes

**Primitive**—belonging to the beginning Primitive man has existed on the earth from very early times, but the date of his origin cannot be fixed

**Springs** A spring is any underground supply of water which overflows at the surface without man's aid The requirements are a porous surface through which water can penetrate, resting on a layer of non porous rock which stops the downward movement of the water

**Nodal towns** are towns at the meeting point of a number of routes The point at which two lines cut is called a node Nodal places on routes are generally centres of much traffic

**Periodic**—at regular intervals of time There was a definite interval of time between two consecutive meetings of periodic fairs, as, for example, yearly, monthly, or weekly Amusements formed an important feature of fairs The *fun of the fair* included jugglers, mountebanks, rope dancers, acrobats, wrestling, and other sports, wild beasts, performing animals, puppet-shows, miracle plays and stage plays of every description, ballad singing, grinning through horse collars, swings, roundabouts, and, in modern times, steam music The charters for nearly all medieval fairs were held by religious associations, and fairs were mostly held on saints' days and often took place in the churchyard In every fair there was a court specially appointed for settling disputes, called in England pie powder court, from the old French *pied pouldre*—dusty foot, or pedlar

**Market**—from Lat *mercatus*, trade In the Middle Ages the right to hold a market was one of the most valuable privileges that a king or lord could grant to a body of his subjects In time, every town of importance had its market, held on certain days, and hence the common name of market town In London there are numerous markets, e.g. *Covent Garden* for fruit, *Billingsgate* for fish, *Smithfield* for meat, and the same plan prevails in other large cities The word market is now often used for the whole of the business transactions in a certain class of trade, whether in London, New York, or elsewhere, e.g. the cotton market, or the wool market refers to all dealings in wool or cotton anywhere, and it implies that there is only one price for the same article

## Exercises.

- 1 Name the gap towns on Fig 4
- 2 Explain the positions of the following places Birmingham, Coolgardie, Canterbury, Winchester, Leeds, Gibraltar, Aden, Singapore
- 3 State the situations of special towns which were founded on (a) islands, (b) hills

- 4 What were the chief requisites for the development of a market town ?
- 5 State the situation of six towns noted for periodic fairs Why were fairs in the Middle Ages of greater importance than they are to day ?
- 6 Name any route centres that you know of in England and Wales
- 7 Explain the following head of ocean navigation , gap town , nodal point , spring
- 8 Contrast the modern means of communication with those of the Middle Ages
- 9 State the situation of six towns at the head of ocean navigation
- 10 Give some account of what you have observed in the illustrations Figs 1 and 2

## CHAPTER II

### EARLY TRADE AND TRADERS 2

**Caravan Routes of Africa** The broken lines on Fig 5 show the paths along which material is carried by camel caravans across the great desert of the Sahara At certain points it is seen that routes meet, and these points mark the oases or water holes of the desert The oases are the trading centres, and are the places where material and water are obtained These routes have been used for countless ages by Arab traders, and are still used to-day

The Sahara, the Great Desert, stretches across the whole breadth of North Africa , its area is nearly equal to that of the United States It is not a sand desert, but is a stony, wind-swept waste with much bare rock visible , only one-ninth of the whole is covered with pure sand The Atlas Mountains form the northern boundary, near the middle is a mountainous region, the Ahaggar plateau, and eastwards of this a backbone of mountain ranges, the Tibesti highlands Near the mountain ranges and high plateaus, local storms sometimes fill the dry water-courses called *wadis* The water sinks underground, and is often tapped by the boring of wells In this way oases are formed

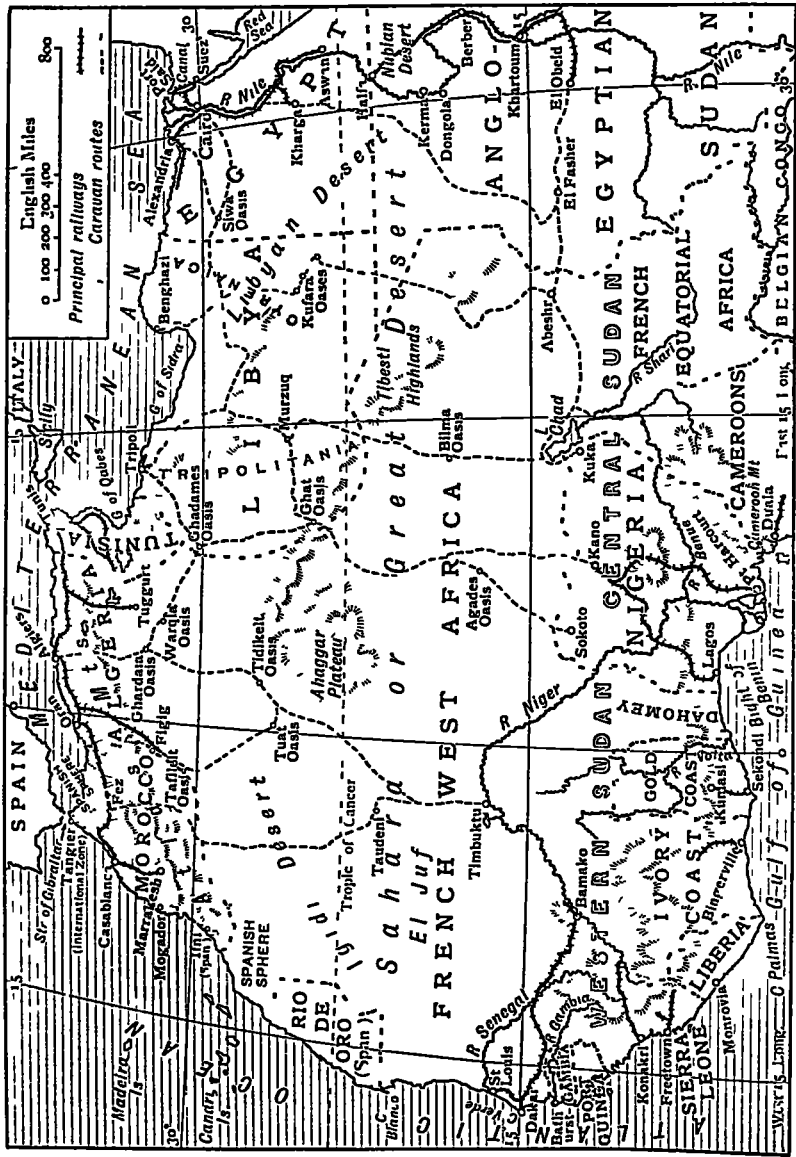


FIG 5.—THE SAHARA OR GREAT DESERT

Note especially the Caravan Routes from the Mediterranean to Timbuktu and Kano

The Sahara is crossed by a number of routes which converge on the ports of the Mediterranean Sea, and link the Nile valley with Arabia, Palestine, and Persia. These routes would be impossible



FIG 6—CARAVAN RESTING AT AN OASIS

without the oases, or fertile spots of the desert, at which the camels and their attendants can obtain water. The largest oases are those of Tuat, Ghat, Fezzan, Kufara, Siwa and Bilma, and they are centres of industry for the production of dates. The southern termini of

the routes, notably **Timbuktu** and **Kano**, were used in very early times, and are still in use to-day in much the same manner as of old

**Caravan Routes of Asia** By similar methods, material from the Far East reached Western Europe before the days of ocean traffic, and in many parts of Asia the caravan routes are still used for trade. The routes of Western Asia indicated on Fig 7 show that they are, to a large extent, determined by the relief of the land, since steep slopes must be avoided if possible, and mountain passes must be selected in crossing high barriers. Water holes always play an important part in fixing caravan routes. Trade by such routes is slow, and only valuable merchandise of small bulk is carried.

Follow the route from the Persian Gulf through Mesopotamia (now called 'Iraq') to the once important city of Antioch, a gap town between the highlands of Syria and Asia Minor. Aleppo was a nodal point from which routes radiated to Smyrna, Constantinople and the *Pilgrim's Way* to Mecca and Medina. Railways now follow some of these routes.

Routes from the Persian Gulf also pass through Tehran, and extend to Trebizond on the Black Sea shore. Notice, too, the important routes to the Khyber and Bolan Passes, the great gates through which ancient conquerors entered north-west India.

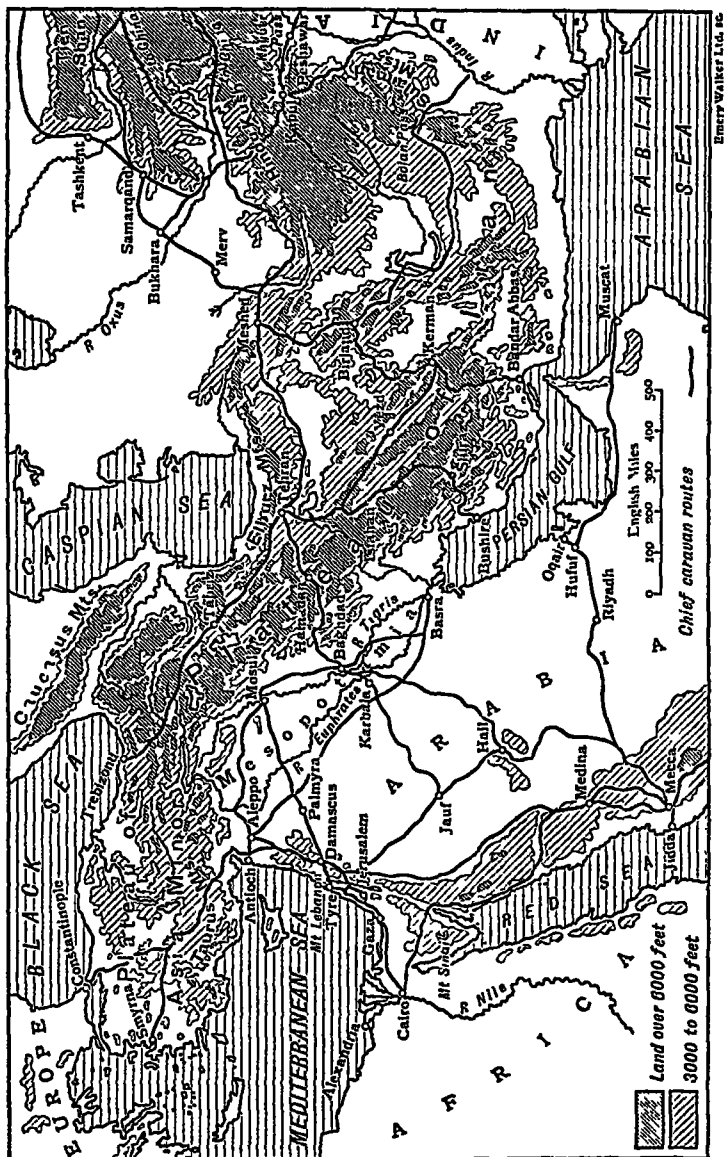
The Persian "Royal Road" from Susa, the ancient capital of Persia, to the port of Ephesus is best seen on Fig 8.

Two main caravan routes extended across the whole of Asia to China, and these routes were the only means by which tea, spices, gems, opium, ivory, and silks reached western Europe in the days before the navigation of the oceans began. The caravans covered astonishing distances over difficult country.

**Early Shipping** Boats in early times were small and of simple construction, they moved from place to place mainly by the aid of wind, current, and the use of oars.

The great trading peoples of early days were the Phoenicians,





Greeks, Carthaginians, and Romans These peoples lived in touch with the sea, and gradually obtained a fair knowledge of the coasts of Europe, Asia Minor, and North Africa Notice, on Fig 8, the situation occupied, on the shores of the Mediterranean, by each of these peoples The earliest *international* communication by water was carried on by the Phoenicians, who founded trading stations on the shores of the Mediterranean Sea, and even reached Britain to trade with the "Tin Islands"—the Scilly Isles and Cornwall

It is supposed that Phoenician ships sailed on the Mediterranean before 2000 B C, Tyre and Sidon being their chief harbours The Carthaginians were great seamen and great traders, and their colony of Carthage on the north coast of Africa, near the modern Tunis, was founded by Phoenician settlers from Tyre, and became the greatest maritime power the world had so far seen Ultimately Carthage had a population of three-quarters of a million, and its ships ventured into the Atlantic and finally reached Britain to obtain tin Caravans brought ivory, slaves, and gold from the interior of Africa Oil and wine were procured from Sicily, and cotton from Malta

The trade was mainly carried on by barter, as there was no coined money Cattle took the place of money, as they do still with some native peoples in Africa

Greek tribes early became acquainted with the sea, and made settlements in Asia Minor, along the shores of the Black Sea, and in Italy They founded the town of Marseilles on the site of an earlier Phoenician settlement By 700 B C they had become very powerful

The great handicap of the early navigators was ignorance of the dangers of the waters they traversed, but gradually they acquired enough confidence to make quite considerable journeys by river and by sea

The use of ships necessitated the development of towns as ports, and in early times the chief ports were situated on the Mediterranean Sea Antioch, Tyre and Alexandria received material from

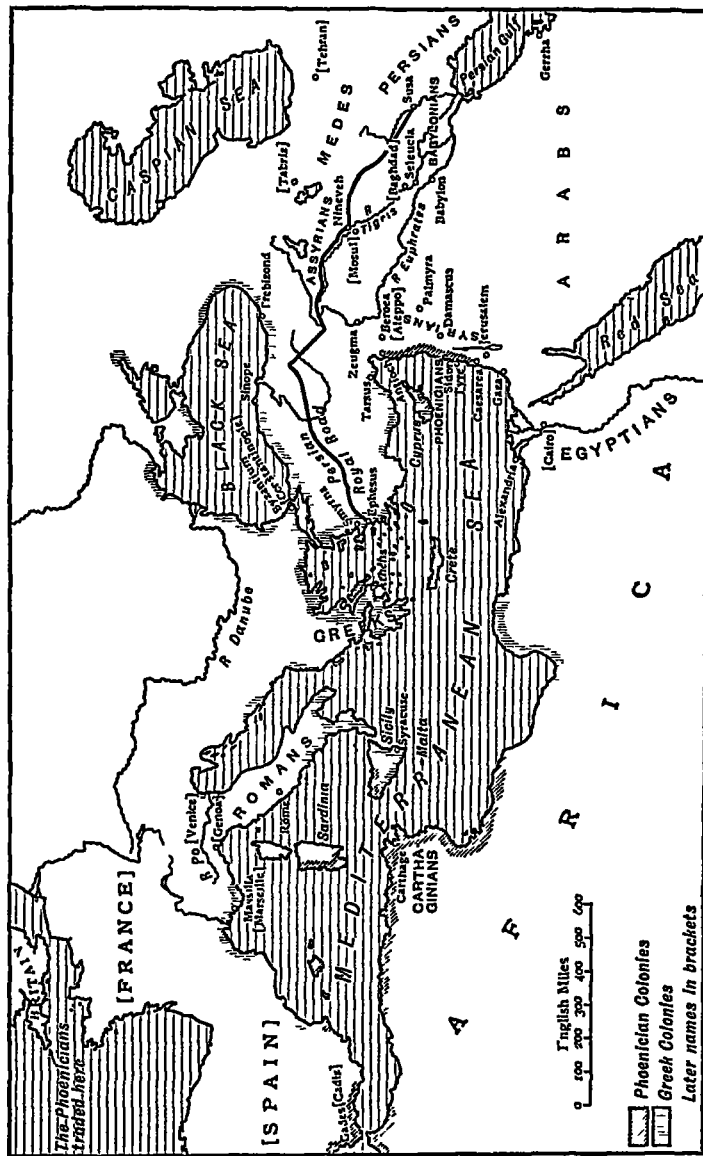


FIG 8.—EARLY PEOPLES OF THE MEDITERRANEAN REGION

the Far East by land routes, and became the ports for the dispatch of that material across the water to Venice

For more than one thousand years Venice was the centre of commerce in the Mediterranean. The repeated invasions of Italy by foreign foes, forced the Venetians to live on the islets at the mouth of the Po. Here, the Rialto, the largest islet, became the chief town and port. Approachable from the mainland only by boats, through river passes easily defended by practised sailors against barbarians, the warehouses, markets, and treasures of the Venetians were safe. The Venetians traded with Constantinople, Greece, Syria, and Egypt.

Following the example of Venice, Genoa rose into great prosperity and power at the foot of the Maritime Alps, and became the rival of Venice, and finally her enemy.

As the art of navigation became better known, and ships became more seaworthy, material from the East was carried across the Indian Ocean and up the Red Sea, and many important ports flourished in the south of Asia. Calicut, in India, was the headquarters of the Arab trade. Material reaching the north end of the Red Sea was carried by camels to the Mediterranean Sea near the mouth of the Nile, to be sent on again by sea to Europe. This, it should be noticed, was the first step towards the establishment of the great route which now passes through the Suez Canal.

In early times men began to use the world's water by launching on it fishing boats for catching the fish living there. Fish is a valuable food for man, and the development of the fishing industry has led to the growth of a large number of fishing ports. Most coastal towns are engaged in the fishing industry to some extent, but only those near large supplies of fish grow into ports of such fame as Yarmouth, Lowestoft, Grimsby, and Aberdeen.

**The Middle Ages** During the Middle Ages, towns formed themselves into leagues for mutual protection. The noted Hanseatic League governed the commercial towns of North Germany during

the later Middle Ages This league gradually spread over eighty-five towns, including Amsterdam, Cologne and Frankfurt, Riga and Danzig The towns of Holland found lasting strength and security because, like Venice, their foundations were laid in the sea Holland was for long the greatest centre of maritime traffic in Europe

The manufactures of England at this time were far exceeded by those of Flanders and the Italian cities English commerce was almost insignificant compared with that carried on by the powerful merchants of the Hansa, or by the traders of Genoa and Venice In the Middle Ages the mainstay of English wealth was wool, which was exported to Flanders to be made into cloth In course of time, England became less and less a wool-exporting country, and more and more a cloth-exporting country In the early Middle Ages, our traders rarely ventured into the Mediterranean, and depended upon the arrival of the Venetian fleet to obtain supplies of cottons, silks, velvets, spices, and precious stones from Southern Europe and the East The ships discharged their goods at Southampton, or at the Cinque Ports, while a large number went to Flanders Gradually the English merchants combined in associations for mutual safety in their trade, and they engaged in traffic both in home-made and foreign wares One of the most famous of these trading companies was the Merchant Adventurers' Company of the 15th century The great trading and exploring voyages of the next century were the natural development of the voyages of this company

#### Notes.

**Caravan**, the name given to a number of travellers, pilgrims, or merchants, crossing the deserts in company for the purposes of safety and convenience

Travelling by caravan is very ancient In the Bible we read of Joseph being sold by his brethren for twenty pieces of silver to "a company of Ishmaelites, coming from Gilead, with their camels bearing spicery and balm and myrrh to Egypt"

**Far East**—the eastern parts of Asia, China, Japan, etc., which for a very long period were reached only by difficult routes

**Mediterranean Sea**, the great sea of the Bible. It is nearly landlocked. It communicates to the west, by the Strait of Gibraltar, with the Atlantic, and to the east, by the Suez Canal with the Red Sea. Many of the early empires, those of the Romans, Greeks, Carthaginians, and Egyptians were on its coasts. The word Mediterranean means *The Middle of the Earth*.

**Oasis** is a fertile spot of the hot desert which receives its water supply from underground springs and wells. The plural of the word is *oases*.

**Suez Canal** links the Mediterranean and Red Seas. It was opened in 1869 and cost £16,000,000. Its length is nearly 100 miles, and it takes about 16 hours to traverse the canal. (See p. 92.)

**Cinque Ports** (*French*, five ports), were originally the five towns of Hastings, Romney, Hythe, Dover, and Sandwich, to which were afterwards added Winchelsea and Rye. During the Middle Ages and beyond, these towns were regarded as the first line of defence against foreign invasion. Because of the great size of modern vessels these towns are now useless as ports, with the exception of Dover, which has an artificial harbour. Romney is now one mile from the sea, its harbour having become completely blocked, Hythe is now half a mile from the sea.

### Exercises.

1 What are some of the difficulties and dangers to be encountered in trading by a Camel Caravan?

2 Give the situation of the following places: Kano, Timbuktu, Tunis, Alexandria, Antioch, Tyre.

3 In what sense was the Mediterranean the "Sea in the Middle of the Earth"?

4 What natural conditions helped Venice to be a great commercial centre?

5 Explain the following: Hanse Towns, wool was the staple of England during the Middle Ages, *oasis*.

6 From the map Fig. 5, state where and what are the following: Nile, Cairo, Khartoum, Chad, Niger, Lagos, Freetown, Senegal.

7 Name the early maritime peoples and the ports used by early navigators.

8 Make a list of towns on caravan routes in Western Asia. (Use Fig. 7.)

9 Name four fishing ports on the east coast of Britain, and account for their importance.

10 Why is it necessary for trade still to be continued by Camel Caravans? Where in N. and W. Africa have railways been constructed? (Use Fig. 5.)

## CHAPTER III

## GREAT DISCOVERIES

**Discovery of America.** Of the world in which we live, very little was known until the 15th century had almost elapsed, but onwards from that time progress became very rapid. In the 400 years that have passed since the discovery of America, the whole world has

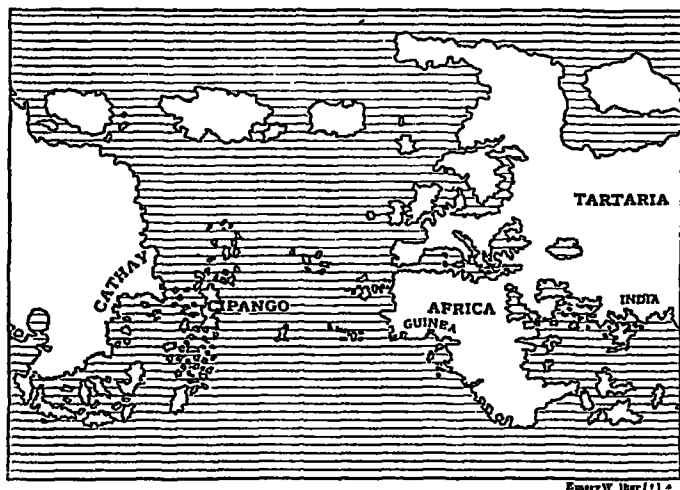


FIG 9—THE WORLD AS IMAGINED IN 1492

been opened up, and every land and ocean has been, more or less, explored. It is important to realise that, in knowledge of the world, man was for ages groping in the dark, when, suddenly, light dawned upon him, and the whole world was rapidly revealed to his view.

At the beginning of the 15th century, the most learned people believed that there was only one huge mass of land, consisting of the three continents of Europe, Africa, and Asia. No geographer

had as yet any idea of the existence of the continents now named North and South America. During the Middle Ages, a few Christian travellers had reached the east of Asia by overland routes, and the land was thought to be a storehouse of riches. The best known of these travellers was a Venetian named Marco Polo, who spent many years at the court of the Emperor of China, and on his return

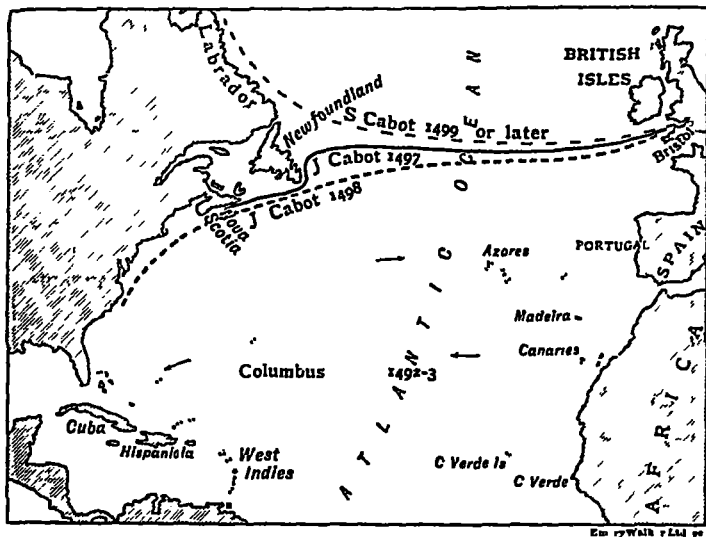


FIG 10—THE DISCOVERY OF AMERICA

wrote an account of that country, which he called Cathay. He had also heard about Japan which he called Cipango (Fig 9). Now if a sea route could be found to Cathay and the Indies (which were thought to be a part of Cathay) an extremely profitable trade would be opened up. Here, then, was the reason for the race between Spain and Portugal to be the first to reach the rich lands of Cathay and Cipango.

Christopher Columbus, sailing from Spain, discovered America at the close of the 15th century, in making an attempt to reach



the Indies by a westward journey Fig 10 shows the route by which he travelled He set sail in 1492 and reached the island now called Cuba, touched Hispaniola, landed in San Salvador and returned in 1493 In his second voyage in 1493, he again reached what are called the West Indies, and, in a third voyage, reached Trinidad These voyages gave man his first knowledge of a continent lying to the west of Europe The name America came into existence after the Italian, Amerigo Vespucci, had in 1504 declared that he was the first to set foot on the mainland of the continent

A few years later, Ferdinand Magellan, a Portuguese, reached the southern end of South America, and made a difficult voyage through the straits which now bear his name He made the first entry into the large ocean which he named the *Pacific* from the calm weather he encountered Magellan proceeded to visit the Philippine Islands, but in a fray with natives of Matan his party was beaten, and he was killed After his death, his fleet doubled the Cape of Good Hope and returned to Seville, having thus completed the first voyage round the world

**The Cape Route** In 1497, Vasco da Gama, a Portuguese, in an attempt to reach the Indies by an eastward journey, rounded the southern end of Africa He thus made an entry into the Indian Ocean from the south, and disclosed the first direct water route to the wealth of the Indies After rounding the southern end of Africa he touched at a point on the east coast which he called Natal, and finally reached Calicut in India This was the beginning of a period of great prosperity for the Portuguese, who thus won the monopoly of the valuable trade to the East It was, in fact, the discovery of a new world no less than the voyage



FIG 11 —NORTH AMERICAN CHIEF

The Red Indians, a copper-coloured race, are natives of America

of Columbus, and was attended by more important consequences than any other discovery in the world's history

Until that time the Venetians held the carrying trade of India. Merchandise was brought to Syria and Egypt by the Persian Gulf and the Red Sea. The Venetians secured the goods at Alexandria, and distributed them over Europe. But pirates—Moors and Turks—swarmed round the shores of the Mediterranean, and raided

the ships. Much merchandise, too, was lost during the overland passage across the sandy isthmus. The newly-discovered sea-route offered a means of bringing the Indian riches direct to the European ports, and there was great joy at da Gama's achievement.

Other explorers followed da Gama, and they established other trading stations such as Goa, in India, and Algoa and Delagoa in Africa. Goa became one of the wealthiest cities of the East, and was the commercial capital of India.

We have seen that the Portuguese had discovered the routes into the Indian and Pacific Oceans, and had reached the Far East by two different directions. The route westward had been discovered with Spanish assistance. An agreement was reached between Spain and Portugal, by which Spain was granted all territory west of a line 370 leagues west of the Cape Verde Islands, and Portugal, all land east of that line.



FIG 12—A KAFFIR WOMAN OF NATAL GRINDING MEALIES

The Kaffirs are a native tribe of S. Africa

The Spaniards and Portuguese were the great pioneers in the attempt to found a world-wide empire and a world-wide commerce, and they met with great success. For a long time they were without serious rivals. Fleet after fleet brought back to Spain and Portugal the silver and other riches of Peru and the valuable commodities of the East. These countries became arrogant with success, and endeavoured to shut out all others from a share in the world's commerce. This was the cause of their downfall.

**England.** The English had meantime been trying to discover a route to Cathay and the Indies. **John Cabot**, a Venetian citizen who had settled in Bristol, was sent by Henry VII to discover India. Sailing from Bristol in 1497, and keeping well to the north of Spanish waters, he reached the American coast in the neighbourhood of Newfoundland or Nova Scotia. He found few inhabitants on the cold inhospitable shores, but he was struck by the immense quantities of fish on the Newfoundland Banks. On his return, all London agreed with him that he had found the mainland of Asia, and that he had only to follow the coast southwards to reach the tropical land of spices and gold.

The merchants of London eagerly helped to equip a second expedition of five ships to reach the coveted lands of Cathay and Cipango. But the expedition was naturally a failure for he discovered only rocky, or forest-clothed coasts. Slowly John Cabot realised the bitter truth. He had not discovered Cathay, but some other land worthless for purposes of trade.

Many heroic attempts were made to discover a **North-West Passage** through the Arctic Ocean. The first to undertake it was **Sebastian Cabot**, the second son of the first explorer. He was turned back by huge icebergs off the bleak Labrador coast. Several other expeditions followed, but the only practical success was the opening up of the Newfoundland fishery.

An Englishman, named **John Hawkins**, made three voyages to

America in 1562-68, and engaged in the dreadful slave trade by taking negroes from Africa to sell to the Spanish for work on the sugar and tobacco plantations

The most noted "sea-dog" of Elizabeth's time was **Sir Francis Drake**, 1515-1596, who is often called the *master pirate*. He waged continual warfare against the Spaniards. In 1572 he sacked **Nombre de Dios**, the Spanish treasure town on the Isthmus of Panama, crossed the isthmus and from a tree gazed on the Pacific, and uttered a prayer that "Almighty God would grant him life and leave to sail an English ship upon that sea", he captured a great Spanish mule-train of treasure and returned home. A few years afterwards Drake sailed on this sea, attacked Spanish colonies, and completed a voyage round the world. He was knighted on his famous vessel the *Golden Hind*. Drake "singd the King of Spain's beard," and delayed the **Armada** for a year, though but second in command, on his famous little *Revenge* he was the inspiring and guiding spirit that defeated the **Armada**. In later adventures to the W Indies he was not so successful, as the Spaniards were prepared for him, he fell a victim to dysentery, and in the ocean found the fitting grave for a mighty seaman.

Other noted men—**Martin Frobisher**, **Sir Humphrey Gilbert**, **Sir Walter Raleigh**—did their share in laying the stepping-stones for England's future Overseas Empire. At the same time, the captains and seamen were gaining great experience of sea life, which was of immense service when the final clash came with Spain. The defeat of the **Invincible Armada**, in 1588, established the equal right of all nations to use the ocean highways and to share in the world's trade.

**The Dutch and English.** The freedom to use the ocean gained in 1588, tempted the Dutch to take a share in the world's commerce, and they soon established an important trade with the

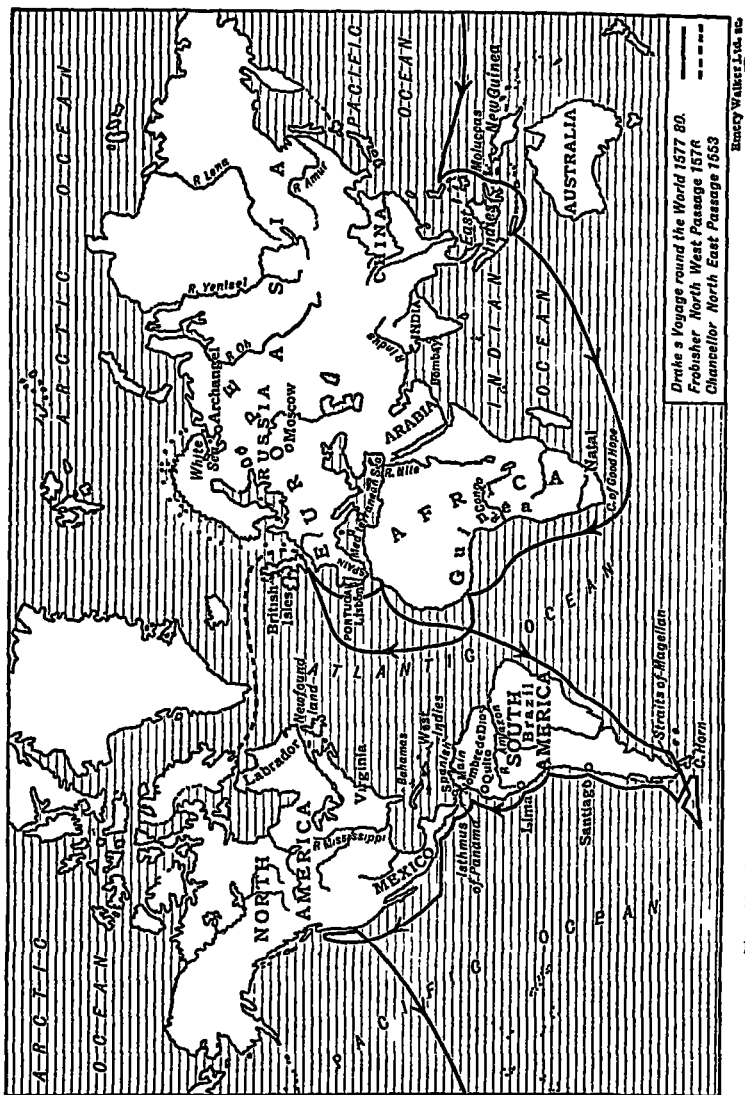


FIG 13 --THE WORLD, SHOWING THE VOYAGES OF DRAKE, FROBISHER AND CHANCELLOR  
(In tracing Drake's voyage follow the lines in the direction of the arrows)

**E Indies and India** The English, by the establishment of the East India Company in 1599, made their first attempt to obtain an eastern trade

The Dutch and English attempts at trade with the East caused them also to take a more important part in geographical discovery and enterprise in eastern waters The Dutch obtained a firm foothold in the E Indies, by the aid of the Dutch East India Company, they established an important trading centre at *Batavia*, and also made settlements in India Rivalry between the Dutch and English often led to conflict, and ultimately the former confined their attention to the E Indies, and the latter to India

**The French and the English** The discoveries of the great continent of America, the southern end of Africa, and the vast lands in the East, gave great opportunities to the peoples of Europe, but also caused discord The English sailors paid no attention to the division of the world made between Spain and Portugal The Dutch and French similarly set themselves out to obtain a share in the wealth of the newly discovered lands The British established their power along the east coast of America, from the St Lawrence to Florida France made settlements in the St Lawrence valley, and near the mouth of the Mississippi Finally, as a result of war with France, **Canada** was ceded to Britain by the Peace of Paris, 1763

British and French interests also clashed in **India** From the time that da Gama reached Calicut, European peoples had been struggling for the trade of India, which had previously been in the hands of the Red Sea Arabs The Portuguese first obtained the trade, and later the Dutch obtained a share, but by the beginning of the 18th century, the French and English had made settlements in India The English had their headquarters at **Madras, Bombay, and Calcutta**, and the French at **Pondicherry** and **Chandernagore** The struggle between the French and English

became acute, and finally led to hostilities in which the British were victorious, and thus became dominant in India. Robert Clive, 1725-74, was the chief founder of the British Empire in India.

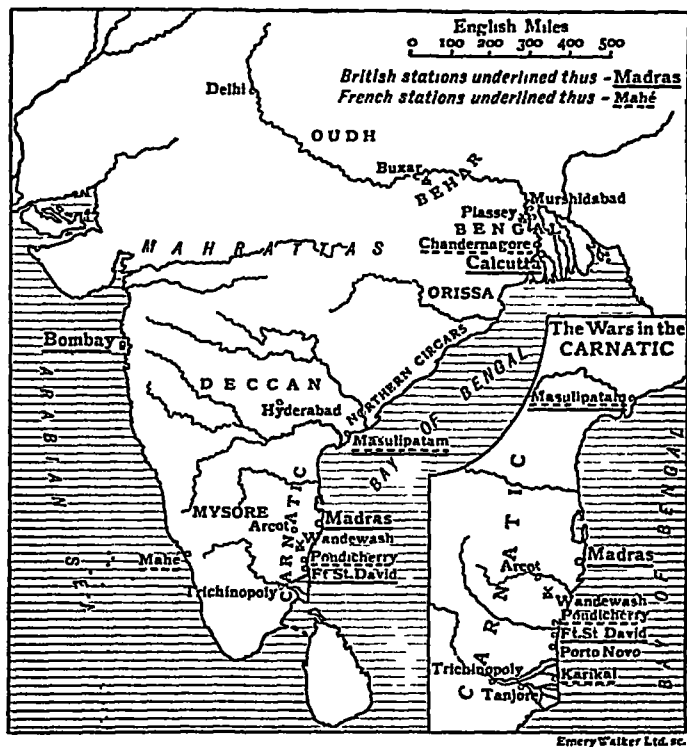


FIG 14—INDIA IN THE TIME OF CLIVE

Australasia was the last great area of the world to be investigated and explored. The Dutch were the first to survey part of its coast, and Dutch names such as Groote Eylandt (Great Island), Dirk Hartog's Island and Van Diemen's Gulf, are reminders of their early work. This is accounted for by the nearness of their Indian colonies to the north-west of Australia.

The English explorers confined their attention principally to the east and south coasts of the continent, and the names on the east coast are English

It is interesting to notice that a number of place-names in Australia and New Zealand indicate thoughts uppermost in the minds of early explorers. Thus we have Shoal Water Bay, Point Danger, Botany Bay, Cape Catastrophe, Poverty Bay and Bay of Islands.

A noted explorer in the Southern Seas during the 18th century was Captain James Cook, 1728-79. On the *Endeavour*, in 1769, he

charted New Zealand and visited the east coast of Australia, returning to England by way of the Cape of Good Hope. During a later voyage, on the *Resolution*, he explored the

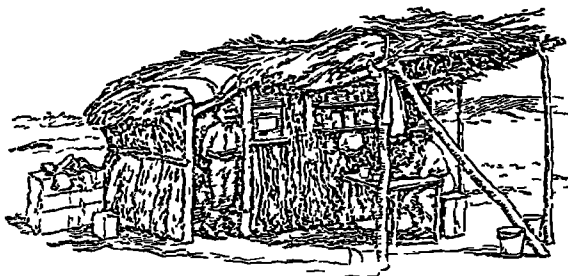


FIG 15 — A POST OFFICE OF W AUSTRALIA IN EARLY DAYS

lands bordering the Antarctic Ocean, and on his return discovered New Caledonia. In 1778 he discovered the Sandwich Islands, where he was murdered by natives while on his way back to the boats.

**Modern Period of Discovery.** The modern period of discovery began in the middle of the 18th century, and has continued to our own times. The aim has been more scientific than commercial. The work has dealt with the investigation of the oceans, and that mainly with the depth, temperature and movements of the water. It has also dealt with the investigation of the Polar regions, and the exploration of previously uncharted inland regions. All this has had a commercial value, and has helped to increase the trade of the world.

During the 17th and 18th centuries the Pacific Ocean, previously



crossed by very few routes, was well opened up, until it became an area crossed by a network of routes, with all the island groups correctly charted

In the last hundred years great progress has been made in **Africa**. Up to the end of the 18th century only the coast was known, and Africa was called the *Dark Continent*, owing to the lack of knowledge of its interior. At the present time much of its surface has been explored, and many trade routes across it have been established. One of the most noted explorers of Central Africa was the Scottish missionary, **David Livingstone**. In 1840 he sailed for South Africa, and for nine years laboured among the natives in Bechuanaland. Later he explored the Zambezi River, discovered the Victoria Falls, Lake Nyasa, and other lakes, and in 1865 started on an expedition to find the sources of the Nile. In October 1871, **H. M. Stanley** found him in sore need at Ujiji. Though very ill, Livingstone refused to return, and continued his search. At Chitambo's village in the district of Ilala on May 1, 1873, he was found dead, kneeling by his bedside.

In the last century, the interior of Australia has been investigated, previously uncharted parts of Asia have been explored, and progress has been made towards unveiling the mysteries of the Polar Regions. **Captain Robert Falcon Scott**, 1868-1912, commanded the *Discovery* and led the Antarctic Expedition, 1901. In 1910 he left England on a second Polar Expedition sailing from New Zealand in the whaler *Terra Nova*—New Land. On January 18, 1912, Scott and his companions, Wilson, Oates, Bowers, and Evans, reached the South Pole to find that **Roald Amundsen** had been there a month before. On their return they were overwhelmed in a blizzard and perished.

The work of explorers and adventurers is of great value. By their efforts the world has become known to us, land masses and oceans have been correctly represented on maps, and the path

prepared for the trader We have now a knowledge of the whole world, and we have markets in every land Land and water are crossed by numerous routes, and a great army of transport workers, in every part of the world, is engaged in carrying products to the areas in which they are needed We should value most highly the efforts of those who plunged into the unknown, and finally revealed to us a wonderful world, rich in a marvellous variety of useful products

### Notes.

**North-West Passage** was the sea route from the Atlantic to the Pacific along the northern coast of America Numerous attempts were made from 1553 onwards to make this journey through the Arctic Ocean to the riches of Cathay (China) Some of the noted voyagers were John and Sebastian Cabot, Frobisher, Gilbert, Davis, Hudson, and Baffin Two centuries later the quest was followed up by Ross, Parry, Franklin and others, but it was not until the years 1903-5 that Amundsen, the discoverer of the South Pole, made the complete voyage

**North-East Passage** was the sea route round the north of Eurasia to Cathay (China) Attempts were undertaken mainly by Englishmen and Dutchmen—Willoughby and Chancellor, 1553, and Barents, a Dutch navigator, in 1594-5 The attempts to find a sea route failed, but succeeded in opening up a trade with Russia in furs, oil, etc

**Marco Polo**, a Venetian traveller, accompanied his father and uncle in 1271 overland to China, which the two elders had already visited Crossing Persia, Western Asia and Tartary through lands then unknown to Europeans, the three Italians crossed the Gobi desert and eventually reached China The Great Khan conferred dignities upon Marco, appointed him governor of a city, and employed him in various political missions The Polos returned to Italy after 24 years' absence Three years later, while fighting the Genoese, Marco was taken prisoner, and during his confinement dictated in French to a fellow captive an account of his discoveries The Book of Marco Polo did much to fire merchants, noblemen, and others with enthusiasm to find a sea route to China

**Natal** is so called because it was discovered by Vasco da Gama in 1497 on Christmas Day, the *natal* day, or *birth*-day, of Christ

**Cape of Good Hope**, the S W extremity of Africa, and the termination of Table Mt., was called the *Cape of Storms* by Portuguese navigators, but the

present name was substituted by John II of Portugal as the discovery was of favourable promise. The name is now also given to one of the four provinces of the Union of South Africa.

**Peru** In 1531 Francisco Pizarro, a Spaniard, crossed the isthmus of Panama, and sailing southwards along the South American coast, reached Peru. His party of invaders climbed the lofty Andes, and overthrew the noted empire of the Incas with terrible ferocity. Pizarro established the new city of Lima near the coast, in place of the Incas' city of Cuzco. The Spaniards were attracted to Peru by the rich silver mines which still yield large quantities annually.

## Exercises.

- 1 Explain the following. The 15th century was the age of discovery.
- 2 (a) What years are included in the 15th century? (b) Name three English navigators who lived in this century.
- 3 How do you account for the following names: America, Hudson Bay, Red Indian, Cape of Good Hope, Natal, Straits of Magellan, Pacific Ocean, West Indies, Newfoundland?
- 4 What circumstances led to the discovery of America?
- 5 Of what importance was the discovery of a sea route to India?
- 6 Explain the importance of the defeat of the Spanish Armada.
- 7 Describe the route taken by Drake in circumnavigating the world. (Use Fig 13.)
- 8 State the situation of the following: Straits of Magellan, Cape of Good Hope, Nombre de Dios, Newfoundland, Natal, Bombay, East Indies, Peru.
- 9 Why were many attempts made by explorers to find the North-West Passage? Why were these attempts unsuccessful?
- 10 What notable achievement is associated with the name of each of the following: Amundsen, Pizarro, Marco Polo, Scott, John Cabot, Magellan?
- 11 How does the work of explorers prepare the way for commerce? Give examples.
- 12 What is a pioneer? Write notes on two who were not Englishmen.

## CHAPTER IV

## TRADE AND TRADERS OF TO DAY

**The Industrial Revolution** At the close of the 18th century, agriculture was the chief occupation in the British Isles. Manufactures, as we understand them to-day, did not exist. All textile materials, mainly woollen and linen goods, were made by hand, in the homes of the people, and factories had not yet been built.

The first steam engine was made in 1769 by James Watt, and this was the sign of a great revolution in the manufacturing industry. Invention followed invention in rapid succession. Hargreaves, in 1764, had made his **spinning-jenny** which enabled many threads to be spun at one time. The invention of the power loom enabled weaving to be carried on at a quicker rate. Steam power, applied to the machines, put an end to hand work, and factories had to be built to hold many workers. The factories were naturally built on the coalfields, and Lancashire and Yorkshire became busy centres for textile work.

The ability to manufacture at a quicker rate increased the demand for raw material, especially cotton, and this led to an increase in trade, and a development of areas in distant lands which were able to supply the raw material.

Another "revolution" now took place which still further stimulated the factory system. Coal, in place of charcoal made from wood, began to be freely used for **smelting iron**. Great quantities of coal and iron were found together in the middle, north, and west of England, iron became cheap, and towns like Birmingham and Sheffield sprang into life, growing, mushroom-like, from tiny villages into populous cities.

To keep pace with the increased output of manufactured goods, and to aid the import of raw material, routes had to be made and

improved So far, little attention had been given in England to the proper construction of roads, there was little travelling for pleasure, and goods were usually conveyed to the markets and fairs on pack-horses Railways, canals, and improved roads were made In 1825 the first railway was built from Stockton to Darlington, and soon a network of railways was constructed In 1830 steam power was applied to ships, thus giving quicker transit across the

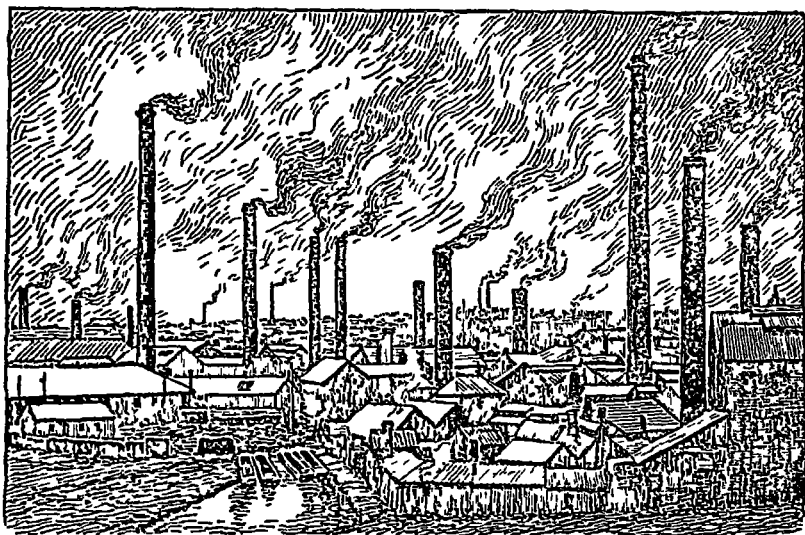


FIG 16 —WORK A DAY BIRMINGHAM.

oceans Countless workers—men, women, and children—toiled ceaselessly at one or another occupation England took the lead of all nations in producing manufactured goods

In recent years the application of electricity to telephony, telegraphy, submarine cables, lighting and transport, has helped in the development of the world's trade Similarly, wireless telegraphy, the growth of motor transport, and the use of aeroplanes and airships, show that progress is constantly being made

**Modern Conditions of Trade** Fig 17 shows that the British control a very large part of the earth's surface, and have possessions in each continent and in each zone of the world. The Empire can therefore supply products suited to every type of climate. The Dutch, once a great maritime power, still possess important territories in the E Indies, the scene of their first great enterprises. The Portuguese, the great leaders in the age of discovery, retain possessions in Africa, but hold nothing in South America where they were once so active. The Germans have lost their colonial empire, which has passed into the keeping of the victors in the Great War.

The value of territory must not be measured alone by its area, but by its resources, and by the ease with which it can be reached and developed. Unproductive land, such as Northern Siberia, has very little value, and does not tempt settlers to live there (Fig 18). Development of any area can only be accomplished by the aid of routes, and if these are not supplied by nature, they are usually made by man, if the wealth of the area is sufficiently great. Since the sea is the great highway for commerce, areas with a coast washed by the ocean are favourably placed for trade, for such areas have access to every other country of the world possessing a sea coast.

**Trade depends in the first place upon products and upon routes.** The country with more products than it can use is anxious to exchange its surplus goods for others. India produces abundant supplies of tea, rice, indigo, jute, hemp, sugar, opium, cotton and oil seeds, and many countries of the world are unable to produce these things, but are anxious to possess them. There are many commodities, however, that India does not produce, but is eager to obtain. For instance, India does not produce much clothing, machinery, furniture, soap, or manufactured goods generally. On the other hand, Britain cannot grow the products of India, but can



manufacture the things that India requires The result is, that one condition for trade between the two countries is fulfilled, each possesses in excess goods which the other requires

Routes are necessary for trade Unless material can be moved from the region of production to the place where it is needed,



FIG 18 —A SAMOYEDS CAMP IN SIBERIA

This picture illustrates the nature of this vast, unproductive land

commerce cannot exist India and Britain each have a long coastline washed by the ocean, which flows continuously from one to the other If the products of each land can be moved to points of the coast where ships can be loaded, the products can be easily transferred across the ocean Areas of production, however, are usually inland, and it is thus clear that routes in India and Britain, viz, roads and railways, are as important as the sea route



The steamboat is the great carrier of goods across the seas, but a number of sailing boats are still used. Ships, after crossing the ocean, penetrate by means of rivers, as far inland as possible, to be

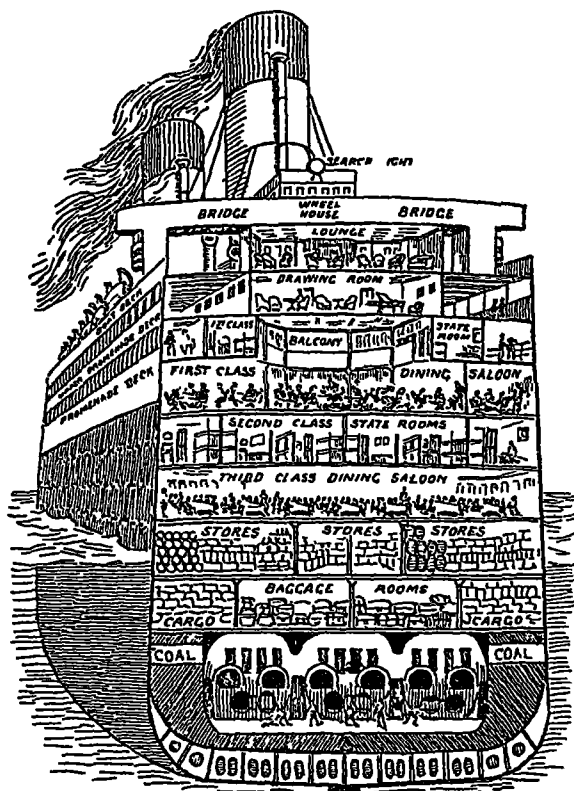


FIG 19 — THE INSIDE OF A BIG LINER

unloaded, and much of the material is often carried farther inland on smaller vessels such as barges.

Canals, linking one river with another, are often constructed, in order that the small vessels can continue their journey inland.

Roads are important for inland transport, and much of the material reaching a port is carried along roads by cart or motor over considerable distances

The steam-driven train carries much material, and has the advantage of great speed. Railway development is necessary before commerce can become great.

An additional form of transport for material is by aeroplane, and the carriage of valuable material by air has been put into effect on a small scale.

The trade of the world is greatly aided by the transport of information by submarine cable, telegraph, telephone and wireless. This is essential for successful commerce, since by such means information as to the condition of markets, the price of material, and the movement of ships, is given very quickly.

The commercial peoples of the world have always inhabited the temperate parts of the globe. Hot countries, in lowland regions, usually have abundance of food products, and, in consequence, there is very little necessity for hard work. Temperate lands are not so productive, and man must work hard to obtain the necessities of life. The commercial importance of the peoples of the world can be judged by reference to the tonnage of ships which are owned by each nation, and which do the bulk of the carrying trade. The following table shows the tonnage of the ships owned by the countries with the greatest carrying trade.

Country					Tonnage of Ships
United Kingdom	-	-	-	-	17.7 million tons
United States	-	-	-	-	12.0 " "
Japan	-	-	-	-	5.0 " "
Norway	-	-	-	-	4.6 " "
Germany	-	-	-	-	4.2 " "
France	-	-	-	-	3.2 " "
Italy	-	-	-	-	2.9 " "
Holland	-	-	-	-	2.8 " "

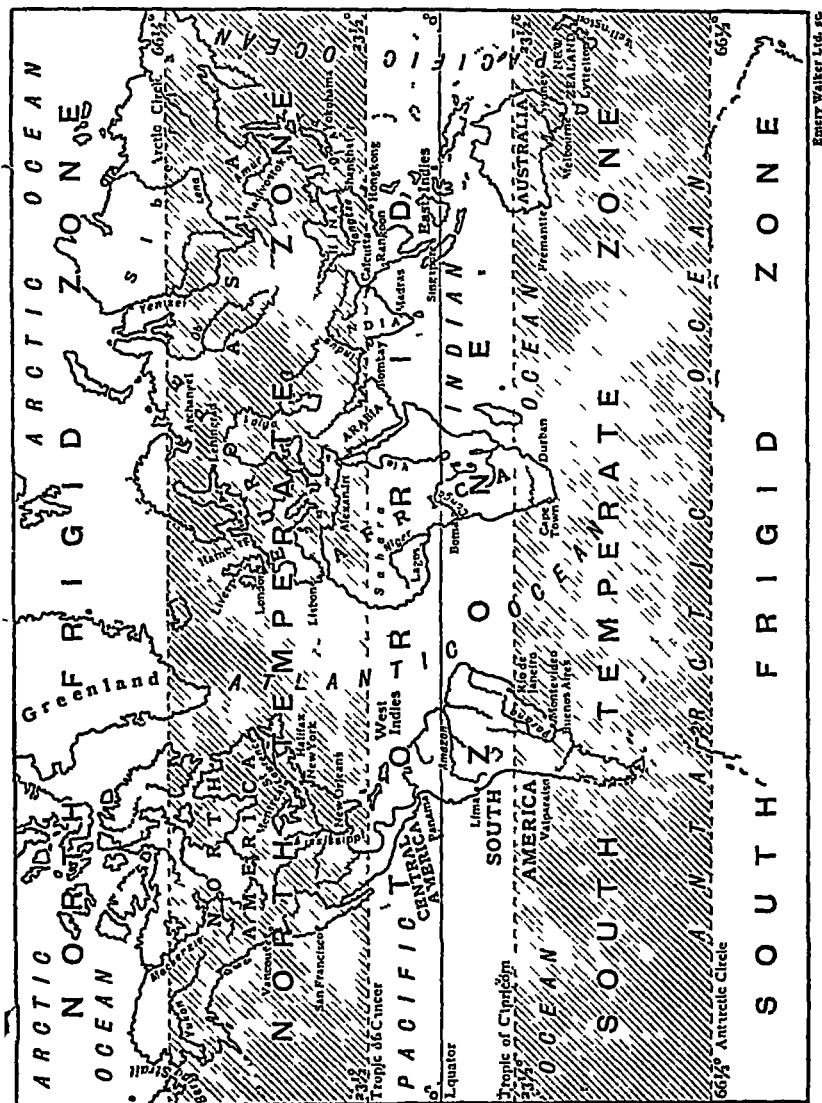


FIG 20 --- Map of the World showing the Zones

**Note the parts of the British Dominions in, or partly in, the Temperate Zones**

The outstanding importance of the **United Kingdom** and the **United States** is obvious from the table. On the map, Fig 20, note the parts of the British Dominions that are in, or partly in, the temperate zones.

Study also the following table, which shows the value of the exports and imports of the chief trading countries of the world (Values are given in millions of £s sterling)

Country	Exports	Imports
United Kingdom	£596	£1,029
United States	688	438
France - - -	140	260
India - - -	157	136
Japan	185	220
Canada -	220	164
China - -	50	60
Germany -	290	267
Italy - - -	112	148
Netherlands - - -	95	120
Australia - - -	128	92
Belgium - - -	73	79

The nature of the exports and imports will be indicated in a later chapter, but the commercial importance of the United Kingdom and of the United States is again clearly seen.

### Exercises

- 1 Name the British Overseas Dominions that are in, or partly in, (a) the temperate zones, (b) the torrid zone
- 2 What do you understand by the Industrial Revolution?
- 3 What are the chief essentials for the commercial importance of a country?
- 4 Why are the important commercial nations situated in the temperate zone? Give examples
- 5 What are the principal exports and imports of India? Give reasons
- 6 What are the two chief essentials for trade? Give examples
- 7 What are the principal means employed for the modern transit of goods and of information?

8 (a) Give the situation of the following countries which have no sea board  
Switzerland, Austria, Tibet, Bolivia, Paraguay, Transvaal, Basuto  
land, Uganda, Abyssinia, Rhodesia, Mongolia, Afghanistan

(b) What are the disadvantages of a country having no sea board?

9 Describe the route of a vessel carrying jute from Calcutta to Dundee, and give the approximate distance travelled (Use Fig 77A)

10 Explain the illustrations Figs 18 and 19

11 In which zones are the following cities Cape Town, Bombay, Wellington, Lagos, Hong Kong, Singapore, San Francisco?

## CHAPTER V

### MODES OF TRANSPORT

**TRANSPORT** is the moving of material from place to place. It may be carried on by water, by land, or by air. Material moved on land may be carried by human beings, pack animals, carts, sledges, motors, or trains. If material is moved on water, ships must be used, and if carried by air, airplanes or airships are needed.

**Human Transport.** The moving of material by human beings is necessary in every part of the world, and in some regions it is the *only* method that can be employed. In Central Africa, parts of China and Japan, and in the forest lands of South America, where there are few beasts of burden, human portage is the chief means of transport. Where roads have not been made, or are impossible, caravans of men must be employed to carry loads from place to place. Thus, in Africa, from the Sudan to the Zambezi, ivory, rubber and palm-nuts are carried by men to the trading stations. The presence of the tsetse fly, too, in parts of Africa prevents the employment of cattle and horses. Explorers marching through an undeveloped region must employ human porters to carry their food and equipment, and the number of men must be large, since a man can only carry a load of about 40 lbs in weight.

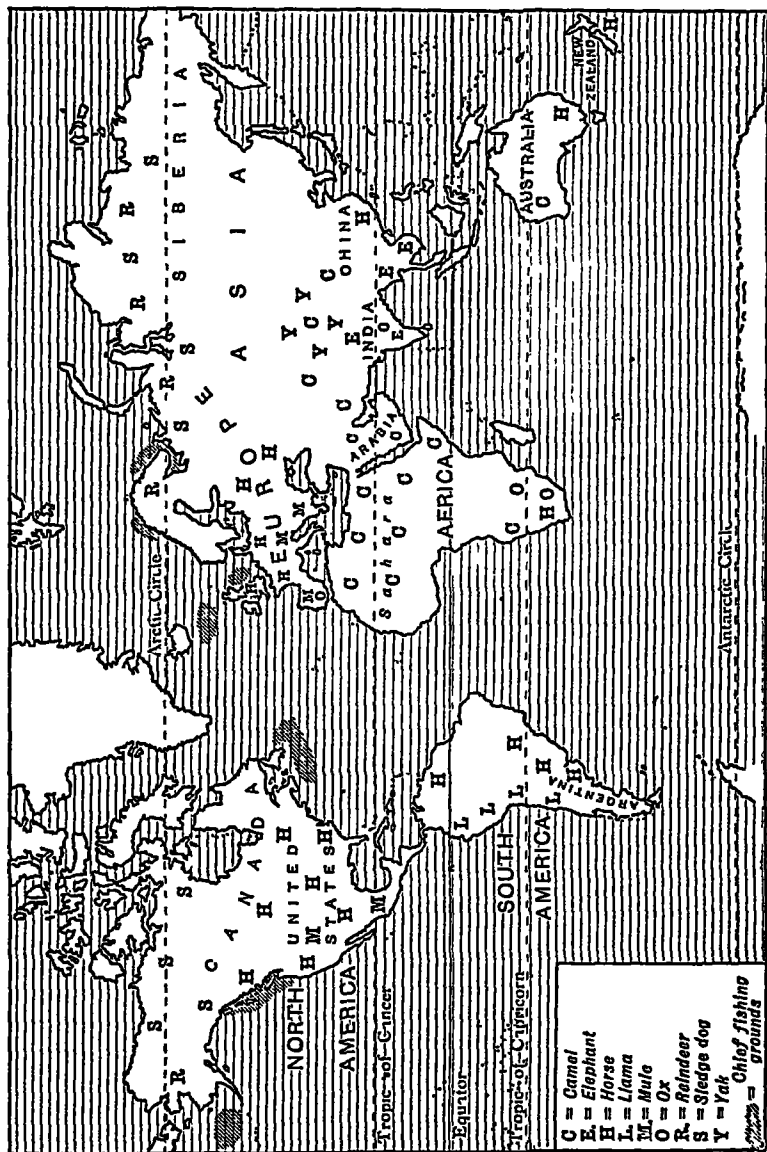
**Animal Transport** Man has domesticated many animals to his service, and in all lands employs them as his beasts of burden. Fig 22 shows the areas of the world in which various animals are used to carry and draw loads. The horse is common in many lands, and as a pack animal it can carry about 3 cwts, when attached to a cart it can draw about one ton.



FIG 21 — WOMEN UNLOADING COAL AT KILINDINI, BRITISH EAST AFRICA

In the hot dry deserts of the world, the **camel** is the chief animal employed for transport purposes, as it is fitted by nature to withstand drought and sandy conditions. It can survive for many days without food or water, can eat the harsh vegetation of the desert, and can walk with ease on loose sandy soil. It can carry a load of about 4 cwts.

The **elephant** is used in India and Burma and parts of Africa to carry loads, and does valuable work in the teak forests of



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FIG 22.—MAP OF THE WORLD SHOWING THE DISTRIBUTION OF ANIMALS FOR TRANSPORT, AND THE CHIEF FISHING GROUNDS

tropical Asia It can carry a load of about 8 cwts In the mountain area of India and in Tibet the yak is the beast of burden, and the mule is of service in the mountain area near the Mediterranean Sea and in Mexico The reindeer and the dog are the transport animals in the cold area in the north of Europe and Asia, and drag the sledges which are made for carrying material over the frozen snow In the mountain area of South America the llamas are the pack animals, they are very sure-



FIG 23 — PLOUGHING IN PALESTINE

footed on mountain slopes Oxen are employed in India South Africa and many other parts of the world to draw wagons, and in Belgium and other countries of Europe the dog is harnessed as a beast of burden

**Transport by Cart and Motor** Roads are a great feature of every commercial country, and are the oldest lines of communication in the world Along the roads, in wheeled vehicles, are carried an immense amount of material and a large number of people Although any one vehicle carries only a small load, the busy state of the roads shows that the total amount must be very great indeed Roads radiate in so many directions that they become very useful



in the collection and distribution of goods In commercial countries the place of the cart is now being taken by the motor, which has the advantage of greater speed and greater capacity

John McAdam, 1756-1836, a Scottish engineer, was the inventor of the modern system of making roads of successive layers of granite or greenstone broken into small lumps In 1815 he became surveyor-general of the Bristol roads, where he employed the method he had invented, which in time was generally adopted and called *macadamising* Before his time the roads were so bad that goods were mostly carried on pack-horses To meet the modern requirements of rapid

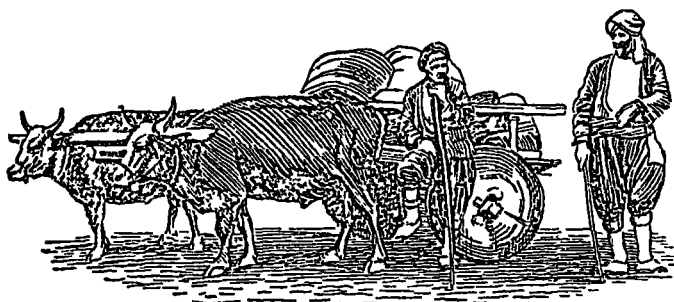


FIG 24—AN OX CART IN TRERIZOND—TURKEY IN ASIA

motor transit in England, great arterial roads covered with tar, to prevent dust, have recently been constructed

**Trains** The iron road, or railroad, is now found in almost every country of the world, yet the steam engine was only invented about a hundred years ago In all regions where man is active, the moving of material by trains is a necessity Movement along the railway line is more rapid than along the roads, and trains can carry a much heavier load than carts The speed of trains, and their capacity for holding goods, has been the cause of the development of networks of lines in all civilised parts of the world

The principal railways of the world are shown on the map in the

middle of the book. Note especially the network of lines in the United States and Europe.

In Canada the first great trunk line stretching across the continent was the Canadian Pacific Railway opened in 1886. Two other similar lines now cross the country, with many branches to important

centres. It will be seen from the map, however, that railways only traverse the southern part of the country, where the bulk of the people live.

In Australia the railways have been constructed generally parallel to the east and south coasts, with branches to the inland centres of industry. There is at present no railway from north to south.

In Africa many lines have been laid in the south, and a considerable part of a great trunk line from the Cape to Cairo has been completed. There are other short lines near the coasts, but no

railways yet cross the continent from east to west, or penetrate far into the interior.

The development of the Argentine in South America has followed the construction of railway routes linking the ports of Buenos Aires and Montevideo with the interior. The Trans-Andean railway from Buenos Aires to Valparaiso in Chile crosses the Andes



FIG 25 —CHRIST OF THE URPAILLITA PASS  
(See p 57)

by means of a tunnel two miles above sea level below the Uspallata Pass. The middle and northern parts of South America are almost without railways, for dense tropical forests clothe the Amazon basin.

In Asia a notable transcontinental line, the Trans-Siberian Railway, crosses southern Siberia so that it is possible to go by rail from Paris eastwards across Eurasia to Vladivostok on the Pacific coast. Note that there are few or no railways in northern Asia, Tibet, Mongolia, China, Siam, Persia, and Arabia.

It should be specially noted on the map that the termini of most of the great railways are at the principal ports of the countries.

**Ships** Ships have been used from very early times to carry material from place to place. In early days they were used only on rivers, lakes, and the waters near the coasts. Gradually, as confidence was gained, journeys became longer, but, as we have already seen, it was not until the close of the 15th century that the world was circumnavigated. To-day, ships sail the oceans in all directions, and they are able to carry very large cargoes.

Boats in early days were small, and were driven by the wind or propelled by oars. One of the earliest boats used by primitive men was the dug-out. This was made by hollowing a tree trunk in such a way that it would float with the hollow part uppermost. The Eskimos constructed the kayak, a waterproof boat covered with the skins of seals. On the river Euphrates in 'Iraq, boats are made of several inflated sheep-skins fastened together by slight poles. In such boats, the boatmen sail down stream with their cargoes, on reaching their goal, they dispose of their goods, deflate the skins, and carry them back on asses which they have brought with them on the boats. At the present day wickerwork boats, water-proofed on the underside, are still in use on British rivers such as the Dee in Cheshire. These boats are used by fishermen, and are similar to the coracles made by the ancient Britons.

The Canadian Indians had their **birch-bark canoes**. These were very light, and could readily be carried on the shoulders of one or two men when obstacles such as rapids and waterfalls impeded the journey. Some of the earliest known boats were the **Egyptian basket-work boats**, made with a wicker frame covered with skins. These held a number of people and were propelled with oars.

Later, men discovered how to make boats with sails. A simple sailing boat is still in use on the Nile (Fig 26). For hundreds of years men have sailed, in such a boat as that illustrated, *against* the current of the Nile, for winds generally blow northwards in the Nile valley. When the men wish to return, the sail is lowered, and the vessel drifts with the current.

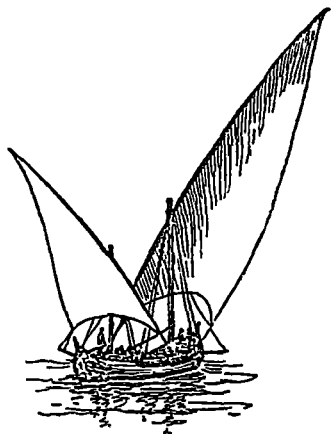


FIG 26 —A NILE BOAT

Men could not venture far out to sea in such small sailing boats, consequently the early sailors only made voyages near the shores of the North Sea, the Mediterranean and China Seas. But, as we know, the more daring went farther and farther from the land, for the Vikings crossed the

North Sea and invaded England in Saxon days. A **Viking ship** was clinker built (that is, with overlapping boards), wholly of oak, about 80 feet long and nearly 20 feet wide. It had a single mast and a square sail in addition to oars. The *White Ship* of Henry I, which foundered in the Channel with Prince William, had 300 passengers and crew on board. Columbus crossed the Atlantic in the *Santa Maria*, which is illustrated in Fig 27. This ship was rebuilt in 1892-3 for the Chicago Exhibition, so that we know exactly what it was like. The length of the ship proper

was 93 feet and its breadth 25 feet, she had an enormous structure aft, three masts and a bowsprit, the outside of the hull was strengthened with extra timber beams. The capacity of Columbus' ship was only 230 tons, but at the time of the great period of ocean exploration, ships had been built of more than 1000 tons.

The invention of the steam engine, and its use in ships, brought about great changes, and soon after, the building of iron ships began. The first steam-driven ship was the *Comet*, so called by Bell, the inventor, because it was built in the comet year 1811. This steamer was employed to carry passengers to and from Helensburgh and Glasgow during the summer of 1812.

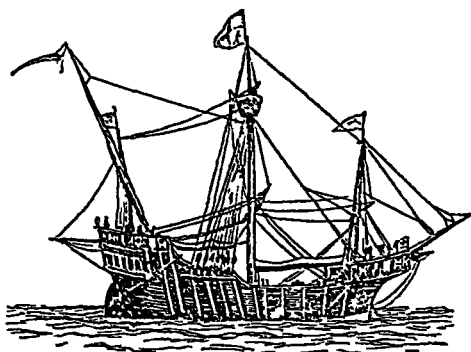


FIG 27 —THE SANTA MARIA

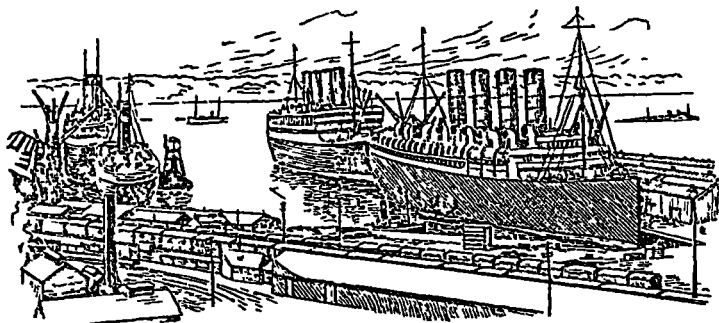


FIG 28 —WHITE STAR DOCK—SOUTHAMPTON

Improvements soon followed, and in 1838 the *Great Western* crossed the Atlantic. The change from wood to iron, and then to steel in the construction of ships, took place very slowly, for there

was a great national prejudice against using iron for "the Wooden Walls of Old England," with their "Hearts of Oak." Gradually, however, the "Wooden Walls" gave place to "Ironclads," and they in turn to steel ships with triple-expansion engines and screw propellers. The *Mauretania* was the fastest steamship afloat in the year 1913. In 1911 it had crossed the Atlantic to America in

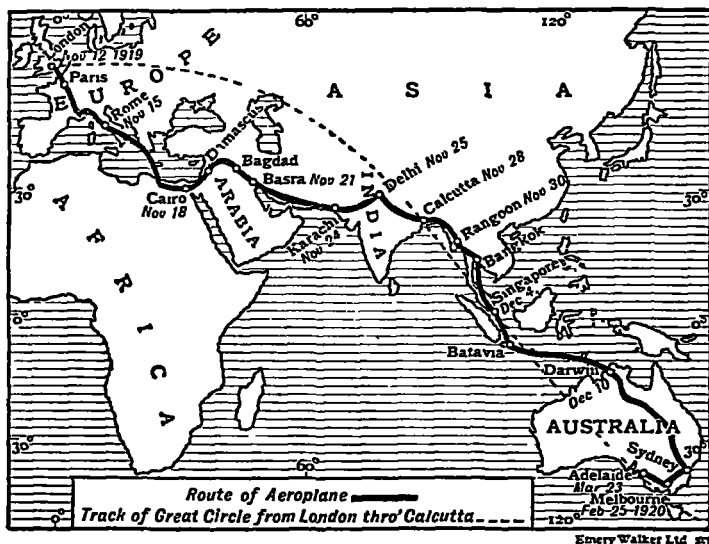


FIG 29—SIR ROSS SMITH'S FLIGHT TO AUSTRALIA

a little less than  $4\frac{1}{2}$  days. The *Comet* was 42 feet long and had engines of 3 horse-power, the *Queen Mary* is 975 feet long and has engines of 80,000 horse-power. The *Queen Elizabeth* is a still larger vessel. Now, more than three-quarters of the number of ships on the ocean are steamers, and many are of great size, exceeding 80,000 tons. They carry large cargoes and some have accommodation for a considerable number of passengers. They have three-quarters of the earth's surface over which they can move freely, and transport by water is cheaper than by land.

**Aeroplanes.** The use of aeroplanes as a mode of transport has been brought about in very recent times. They have the advantage of great speed, but can carry only a small amount of material. Transport by air is costly, and is not much used at present for



FIG 30 —SIR ALAN COBHAM'S FLIGHT TO CAPE TOWN

business purposes, but improvements are rapidly being made, and pioneers are preparing the way for a regular air-service round the world. In 1920 Sir Ross Smith completed a flight from London to Adelaide, Australia, Fig 29. In 1926 Alan Cobham completed a trip from England to the Cape, and another from England to Australia and back, after which he was knighted. He was the first

airman to fly to the Cape and back, but Sir P. Van Ryneveld and Sir C. J. Quintin Brand, in 1920, flew from England to the Cape. Cobham's return journey of 8,020 mls took fifteen days, although the actual flying time was only 80 hours, so that the average rate of flying was about 100 mls per hour (See Fig 30)

**Underground Transport** We are probably all familiar with underground railways and should realise how they relieve the congestion upon surface routes. It should also be remembered that much material is conveyed beneath the surface by means of pipes. Gas and water are pumped, at great speed, through a remarkable system of pipes, other pipes containing wires are placed underground to convey electricity for illumination, heating, and power, much use, too, is made of pipes in the United States and other parts for the transport of petroleum. Such transport is unobserved by those who move on the earth's surface, but it is essential for man's welfare.

### Notes.

**Yak**, an animal belonging to the ox family, and found only in Tibet and parts of China. It is covered

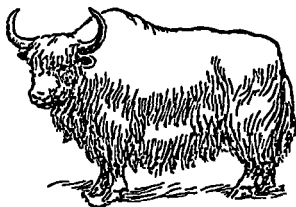


FIG 31.—THE YAK

with long hair which grows from the limbs, tail, and under parts, and thus hair is often so long that it reaches the ground. The yak exists in both the wild and the domesticated state. In the wild state it is found in the most rugged districts, and always at a great height, as it does not like heat. The Tibetans use the yak as a beast of burden as well as for food.

**Reindeer**, a kind of deer found in N. Europe, Siberia, Newfoundland and Canada. It is the only deer that has been successfully domesticated. In its wild state the reindeer lives in summer in the grassy valleys, in winter moving to the mountains where it subsists on the scanty growths of lichens and moss. The Canadian reindeer, or caribou, has never been domesticated. To the Laplanders, Eskimos, and people of Northern Siberia, the reindeer is the source of food, clothing and transport, in fact, a great part of Lapland



and Siberia would be almost uninhabitable without this useful and picturesque animal

**Llama**, an animal found only in S America, chiefly in mountainous districts of the Andes. It belongs to the camel family, but is smaller and has no hump. The hair is long and woolly. It has been used from very early times as a beast of burden and for riding. The wild species are known as the guanaco and the vicuna, another and smaller breed is called the alpaca



FIG 32 —THE REINDEER.



FIG 33 —THE LLAMA

**Kayak**, a long narrow skin canoe, about 17 ft long and 2 ft wide. The occupant wears a sealskin coat which is tightly laced all round to the sides of the boat, making it secure against the entrance of water

**Uspallata Pass**. At this mountain pass of the Andes, on the boundary between Argentina and Chile, is a striking bronze figure of the Christ, erected to commemorate the treaty of peace entered into by these countries. On a tablet is this inscription: "Sooner shall these mountains crumble to dust than the people of Argentina and Chile break the peace to which they have pledged themselves at the feet of Christ the Redeemer"

## Exercises

- 1 Where are human porters the chief means of transport? Give reasons
- 2 Name the important transport animals, and the areas of the world where they work
- 3 Explain the illustrations, Figs 23 and 28
- 4 Compare the means of transport in England at the present time with the means in use during the 18th century
- 5 Write a brief summary of the development of boats and ships from early times to the present day
- 6 Explain the following macadamised roads, "ship of the desert", Trans Andean, Trans Siberian, Viking, ironclads

7 Name one town in each of the countries where the following animals are used as beasts of burden camel, yak, dog, llama, elephant

8 Where are the following Canton, Buenos Aires, Vladivostok, Valparaiso, Euphrates, Nile?

9 Where are the principal lines of railway in Canada South America, Australia and Africa respectively?

10 What do you understand by underground transport?

11 Over which countries did Sir Ross Smith pass on his flight to Australia? (Fig 29)

12 Name the principal places on the Air Route from London to Cape Town (Fig 30)

## CHAPTER VI

### THE OCEAN HIGHWAY—PORTS

**Ports on River Estuaries** Ports are those places on the water routes where ships can find accommodation during the processes of loading and unloading. Any natural inlet of a coast offering deep water and shelter is a good site for a port, if the region near by can offer the material necessary for trade. Both points are of first rate importance—the ships must be able to reach the port easily, and they must find there material to carry. These points can be made clear by studying a few examples.

A river estuary is the most common site for a port, since it is the natural meeting point of ocean and river routes. The port on a river mouth usually develops at what is called the **limit of ocean navigation**, that is, at the point which marks the limit to which the large vessels can penetrate. The river estuary usually has tides which help shipping in two ways. In the first place, high tide gives deep water, and, secondly, the flow assists ships in reaching the port, while the ebb helps them in leaving the port. The more shallow part of a river beyond the port at the mouth can be used by

smaller vessels, such as barges, which play an important part in the work of a port

**London.** London is the seat of Government of the Motherland and of the Empire, it is the nearest big city to the Continent, it is the chief port of the United Kingdom, and it is the largest city in the world. London stands at the lowest point on the Thames which can be bridged, it lies on both sides of the river, which is crossed by many bridges and railways. So much business is carried



FIG 34—THE THAMES, SHOWING THE TOWER BRIDGE IN THE DISTANCE

on near the river and the docks, that the population of over seven million people has been driven outwards to live in the suburbs

The greatness of London has been founded on commerce. From a livery company known as the Mercers' grew a body called the Merchant Adventurers' Company, the first of the many great trading companies which helped to develop the resources of the New World. The first Royal Exchange was built in Elizabeth's reign, the Bank of England was founded in 1694, thus showing that London bankers had taken the place of the foreign bankers of the Middle Ages.

There is not one great manufacturing centre in London, yet in actual output it is the largest manufacturing centre in the Empire.

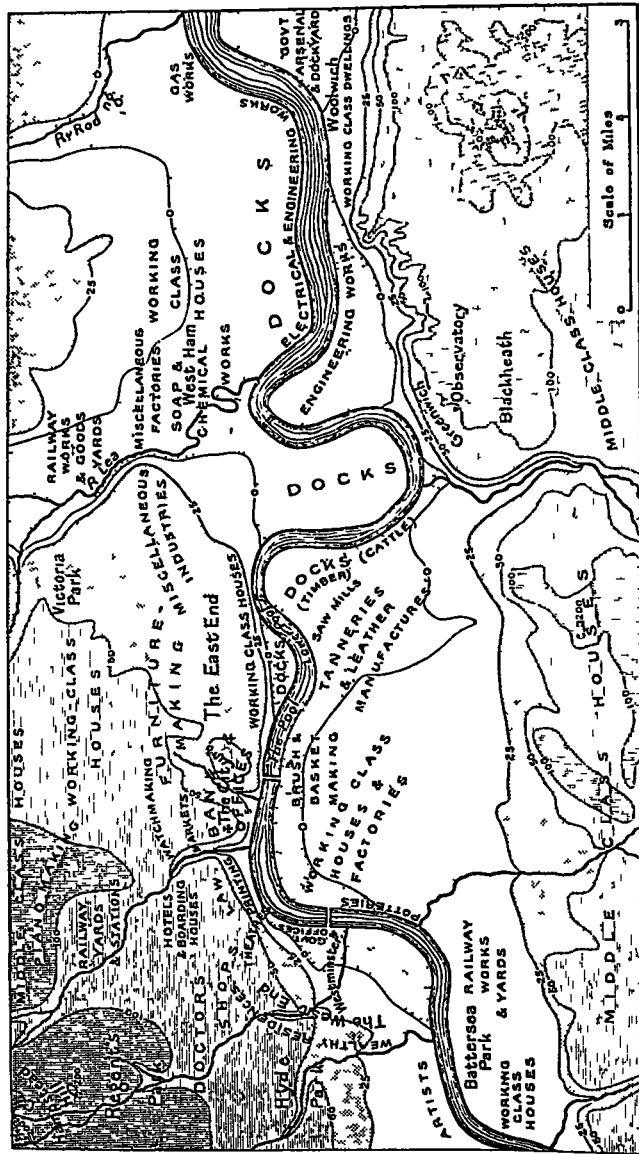


FIG 30 - THE INDUSTRIES OF LONDON

The dotted area alongside the river is that which, in the absence of artificial embankment, is marshy ground, liable to be flooded at high tide

London has many manufactures, such as books, pottery, jam, pickles, biscuits, leather, bricks, sugar, furniture, watches, clocks, jewellery, soap, matches, glass, paper, varnish, paint, chemicals, and a host of other things (See Fig 35)

There are many markets, such as Covent Garden, for fruits, vegetables and flowers, Smithfield meat market, Billingsgate fish market, Deptford cattle market, Whitechapel hay market

Notably in the West End are enormous shops where almost everything needed for a household can be bought. The busy heart of London, called the City, is chiefly a place of banks, offices, and warehouses

London is covered by a network of railways, including surface and underground railways, and "tubes". In addition, trams and motor-omnibuses run in all directions, and thousands of taxi-cabs ply for hire. There are some 630 railway stations in Greater London, and all the trunk lines have termini there. It is calculated that by train, bus or other public conveyance some 4,000,000,000 passengers travel in Greater London during a year.

**Glasgow** The situation of Glasgow on the Clyde estuary, in the heart of the rich lowland area of Scotland, and facing the Atlantic and N America, has been the chief factor in making this one of the greatest commercial cities in the world. As early as the 13th century, Glasgow had begun to be the mart for trade with the W Highlands. Its foreign trade is said to have begun about 1420 by the export of cured salmon and herring to France, where they were exchanged for brandy and salt.

In the middle of the 17th century, a whale-fishing company was started, but the greatest of all industries began a century later with the weaving of cotton. After the construction of the steamboat *Comet*, began the great modern steamship industry of Glasgow. The Clyde was gradually deepened, and it is now possible for the

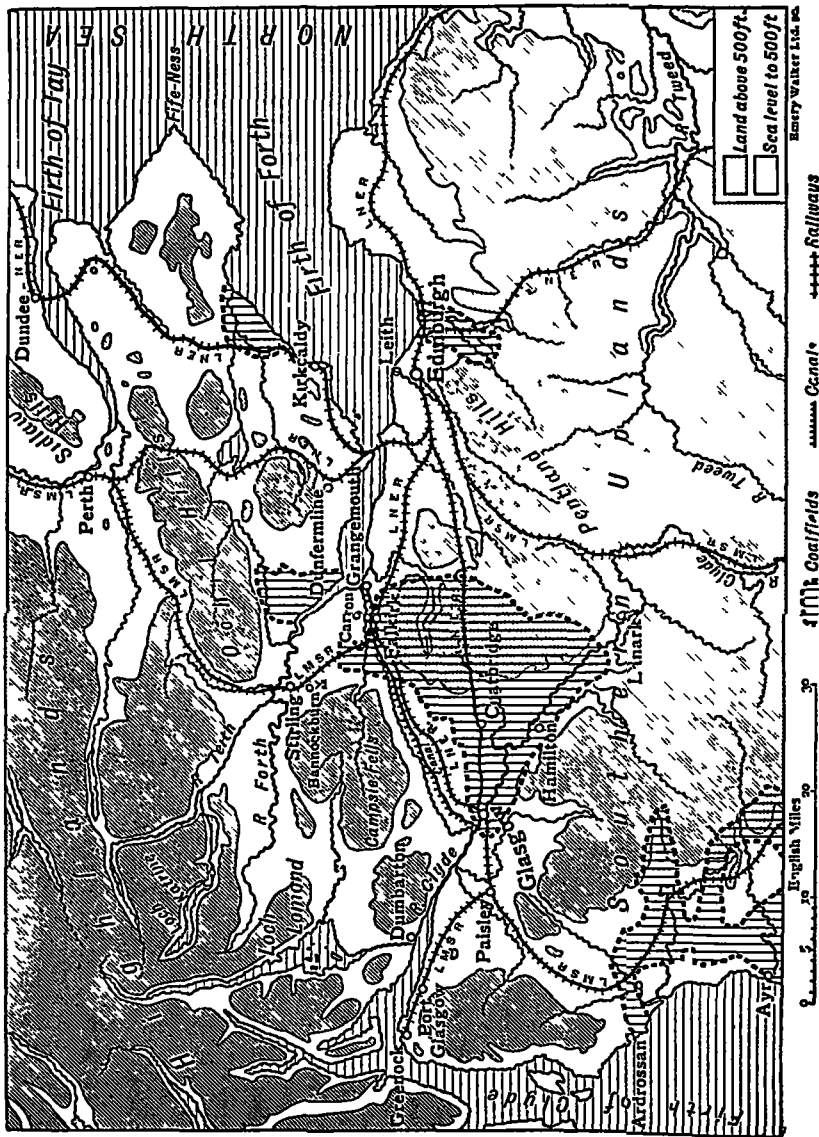


FIG 30.—THE CENTRAL LOWLANDS OF SCOTLAND  
Note the situation of Glasgow

heaviest and largest ships to pass down the waterway To-day, the whole riverside for many miles is occupied by docks or by shipbuilding yards

When the demand came for iron ships, the great ironworks of Carron were established The Forth and Clyde Canal was completed in 1790, and several other canals have since been constructed Many

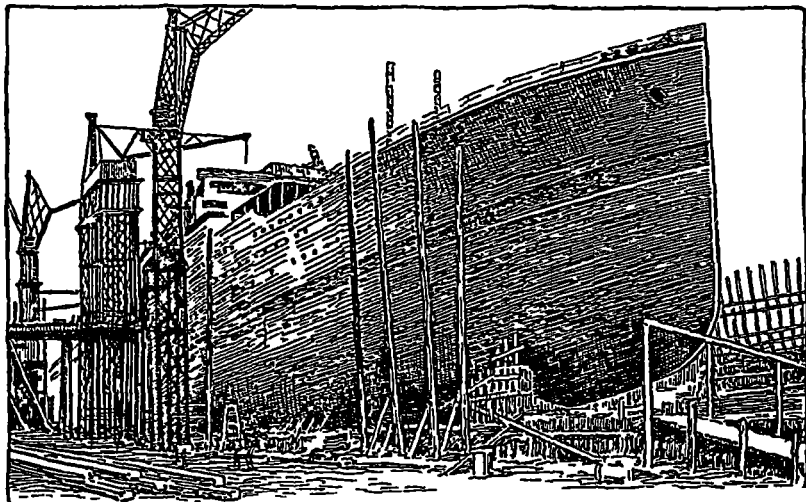


FIG 37 —SHIPBUILDING ON THE CLYDE

railways now serve as feeders to the city, and a great locomotive industry has grown up, the Locomotive Works at St Rollox, a district of N E Glasgow, are the largest in the world Look carefully at the map, Fig 36, and notice the situation of Glasgow with respect to the lowland plain, the coalfields, railways, canals, and other large towns in Scotland

River ports are common in most countries of the world, and the following are other important examples Hamburg on the Elbe, Antwerp on the Schelde, Rouen on the Seine, Montreal on the St

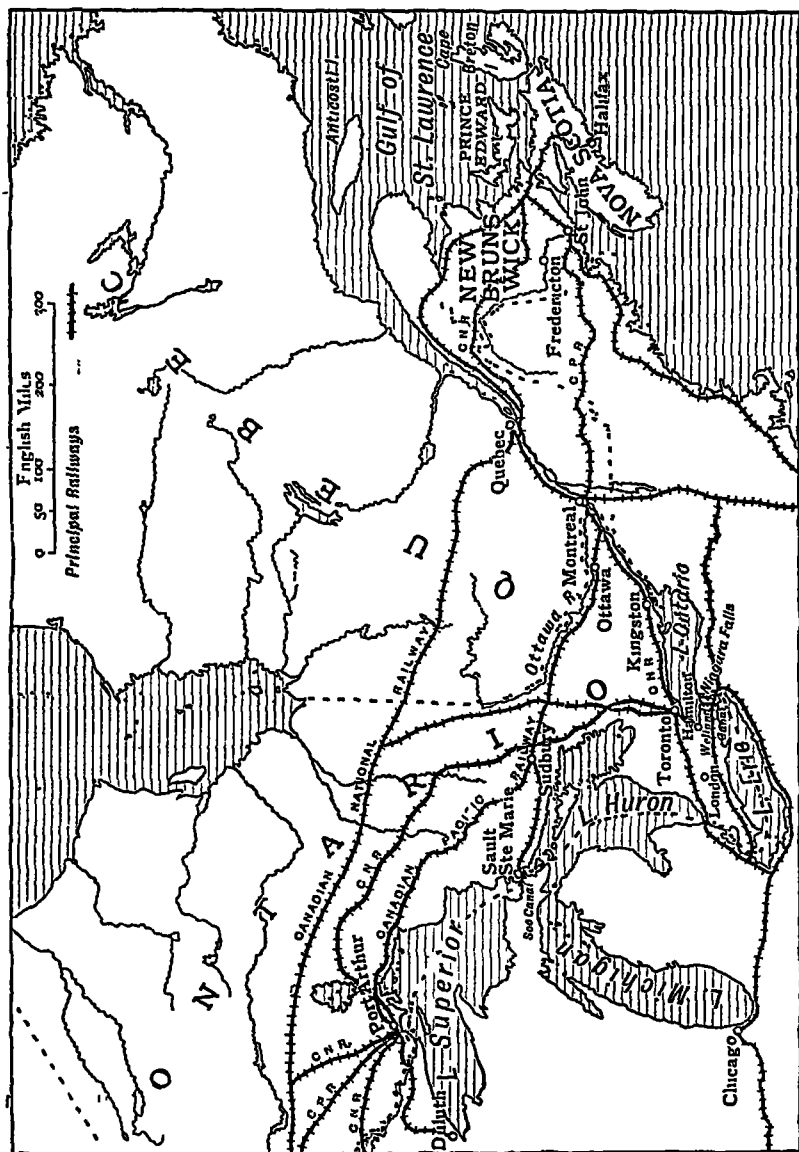
Lawrence, New Orleans on the Mississippi, Calcutta on the Ganges, Shanghai on the Yangtze Kiang, and Montevideo on the La Plata

**River and Lake Ports** Study Fig 38, and notice the situations of the river and lake ports on the St Lawrence and the—Great Lakes

The great bulk of the people of Canada live in a somewhat narrow tract of land, stretching across the south of the Dominion from the Atlantic coast to the Rockies. It is necessary for the prosperity of the country that the products of the wheat lands, the cattle, the dairy produce, the timber, the fruit, and fish should be readily transported from place to place (*a*) within the country, and (*b*) to ports, for transport by lake, river, and ocean to other countries. From these countries the products can be exchanged for wearing apparel, iron and steel goods, sugar, coal, maize, tobacco, etc., which are not produced in sufficient quantities in Canada for the people's need. There are two main sources of transport—the magnificent waterways of rivers and lakes, and the railways. The St Lawrence waterway is the most important.

Rapids, waterfalls, and shallows occur in many places, but these hindrances to the passage of large vessels have been overcome by the cutting of canals. The Welland Canal has been constructed to overcome the obstacle of the Niagara Falls, between Lakes Erie and Ontario, between Ontario and Montreal the St Lawrence has been deepened in some places, and canals have been constructed in others, so that vessels of moderate size can pass freely through this section of the St Lawrence waterway. Between Lakes Superior and Huron are the noted Sault Ste Marie or Soo canals, one belonging to Canada and the other to the United States. Through these canals are carried enormous quantities of wheat, iron ore, coal, wood pulp, timber, flour, and other products. The freightage through these canals is five times greater than that through the St Lawrence. There are several other canals, but none has so much





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FIG 38.—THE DOMINION OF CANADA—EASTERN PROVINCES

traffic as the Soo canals From Port Arthur, Fort William, and other lake ports on the western end of Lake Superior, grain and other products of the west can be shipped by lake, river, and canal to Montreal, and so across the Atlantic during the summer months The St Lawrence estuary is impassable from November to April

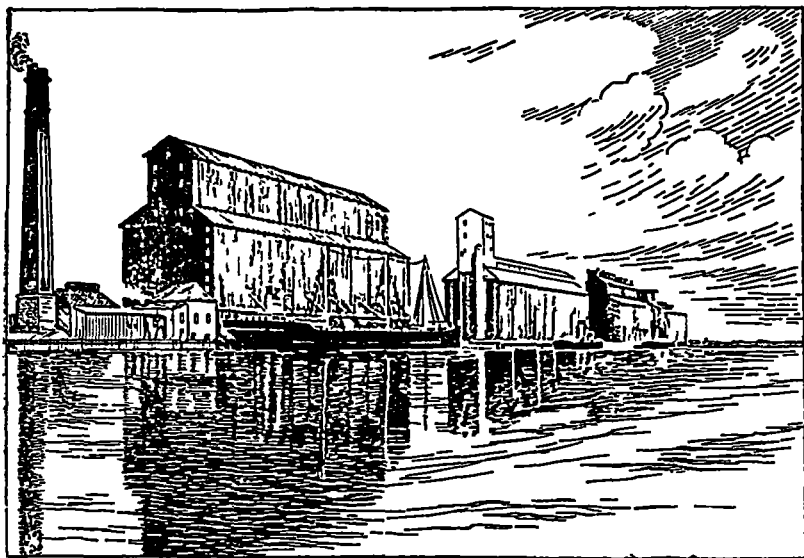


FIG 39 —WHEAT ELEVATORS AT FORT WILLIAM

Note the ends of the pipes through which the wheat is poured into the vessel

and the products are then sent by rail to the ice-free ports of **Halifax** and **St John**

The United States has a share in the waterways of the Great Lakes, for the boundary between Canada and the States passes through the middle of Lakes Superior, Huron Erie, and Ontario, leaving the great Lake Michigan wholly within the United States At the junction of two or more rivers, at the river mouths, and on the Lakes, we find many great cities

**Chicago**, with a population of over three millions, is the second largest city in the United States. In the year 1830, Chicago had less than 100 inhabitants. Railways now radiate from it like the spokes of a wheel, joining Chicago with the commercial capital, New York, on the Atlantic coast, and with the grain and meat states in almost every direction. But Chicago is not only a railway centre, it is a great port. A small river enters Lake Michigan where Chicago stands, and docks extending over 40 miles have been made. Coal, iron, timber, cattle, hogs, and cereals are all easily brought to Chicago, so that the city is like a huge market. Indeed, Chicago is the biggest wheat and meat market in the world. Many thousands of animals are killed there daily, the greater number being made into canned beef or canned pork. In addition, there are factories for making railway material, furniture, leather goods, etc., in the great elevators on the Lake, grain is stored ready to be sent by lake steamers to **Buffalo** on Lake Erie for transport by rail or canal to New York, or it may be sent to Montreal for export to Europe.

**Duluth**, on Lake Superior, is the rival grain port of Port Arthur in Canada. In its harbour can be seen scores and scores of ships that hail from all parts of the Great Lakes. They come laden with merchandise and coal for the north-west, and go away laden with grain, flour, and iron ore.

**Ports on Fjords** The fjords of Norway, sheltered by islands, are excellent natural harbours. A fiord is a type of inlet found on the coasts of regions which have been greatly glaciated. During the Ice Age, glaciers scooped out deep trough-like valleys with precipitous sides, and the disappearance of the glaciers admitted the sea. A fiord is usually very deep, except near the entrance, and in some cases subsidence of the land has added to its size. Coasts with fjords are found in Norway, the west coast of Scotland, and British Columbia in western Canada. In Norway, the two

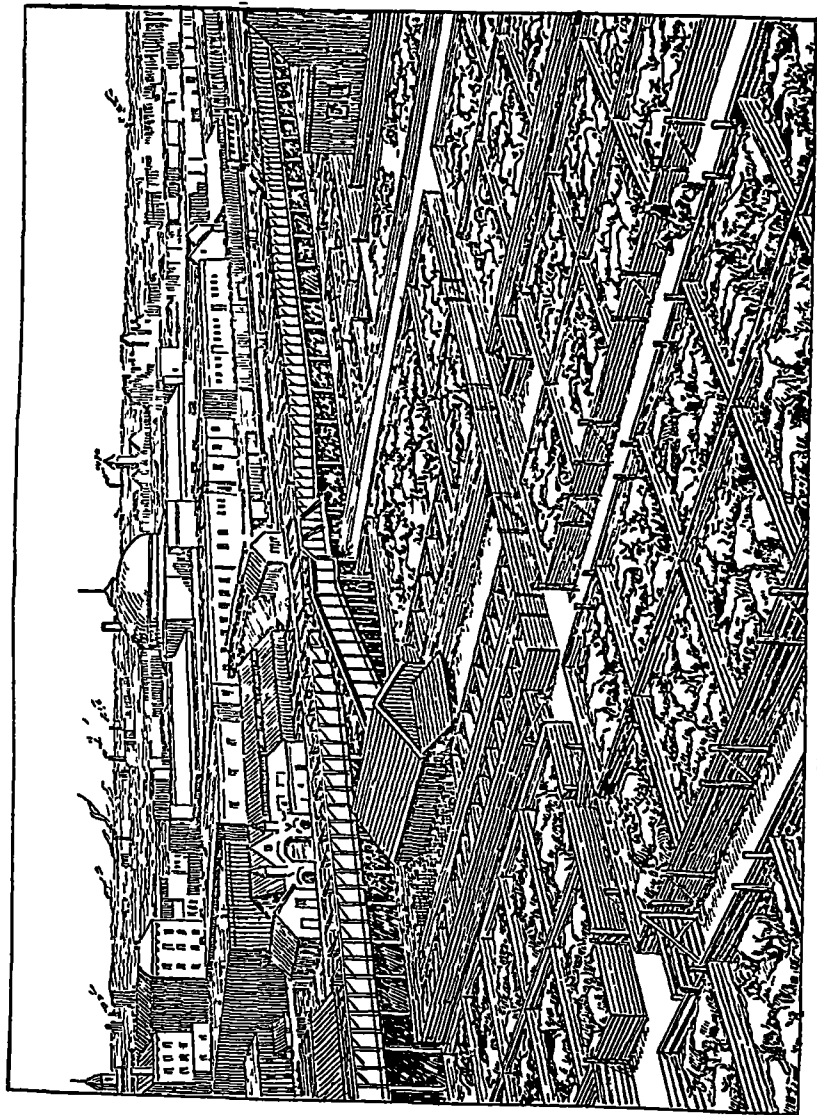


FIG 10.—THE UNION STOCK YARDS AT CHICAGO

most important are the Hardanger Fiord on which is Bergen, and the Trondhjem Fiord on which is Trondhjem. Steamers are able



FIG. 41—SCANDINAVIA AND DENMARK

to sail in smooth waters into the heart of these deep gorges, and Bergen and Trondhjem are important fishing ports, for the group of the Lofoten Islands is a noted feeding ground for cod. You will see from the map that these ports are joined by rail to Oslo the

capital of Norway, with Stockholm the capital of Sweden, and with other important towns

**Drowned Valley Ports** A river valley which has been made very deep by the slow sinking of the land, forms an excellent natural harbour. New York and San Francisco are good examples of ports on drowned valleys. Such valleys are usually narrow at the mouth and broader within, and are thus well protected by nature. Study Fig 42, and notice how New York, the commercial capital of the United States, has been made important by the canal link with the Great Lakes. (The political capital of U S A is Washington)

Some of the reasons for the commercial supremacy of New York are as follows

(1) New York City, situated on Manhattan Island at the mouth of the river Hudson, has excellent harbourage for the largest liners

(2) It is in the middle of the Atlantic Coast, so that vessels reach it from all directions, and its harbour is never frozen

(3) It is connected with the grain lands, and with the iron and the coal of the west, by means of river and canal. The Erie Canal has been cut in the most important water gap of the Appalachian Highlands. This gap is made by the River Mohawk, which flows into the Hudson, and the Mohawk is joined to Lake Erie by a canal

(4) It is joined to Montreal, the chief port of Canada, by means of a canal, which joins the Hudson River with Lake Champlain, this lake is joined by a river to the St Lawrence

(5) Oil from the oilfields in the Pittsburg district is pumped through pipes direct to New York

(6) The great transcontinental railways converge on New York

Thus New York has all the advantages which go to make a great commercial and industrial centre. The city itself is built on Manhattan Island, which is connected with Long Island by the Brooklyn Suspension Bridge and others. Vessels of all nationalities and sizes pass Sandy Hook and the Statue of Liberty on their way



to the commodious docks and wharves of the inner harbour Its main street is Broadway, and its best known "avenue" is Fifth Avenue The Stock Exchange in Wall Street ranks next to that of

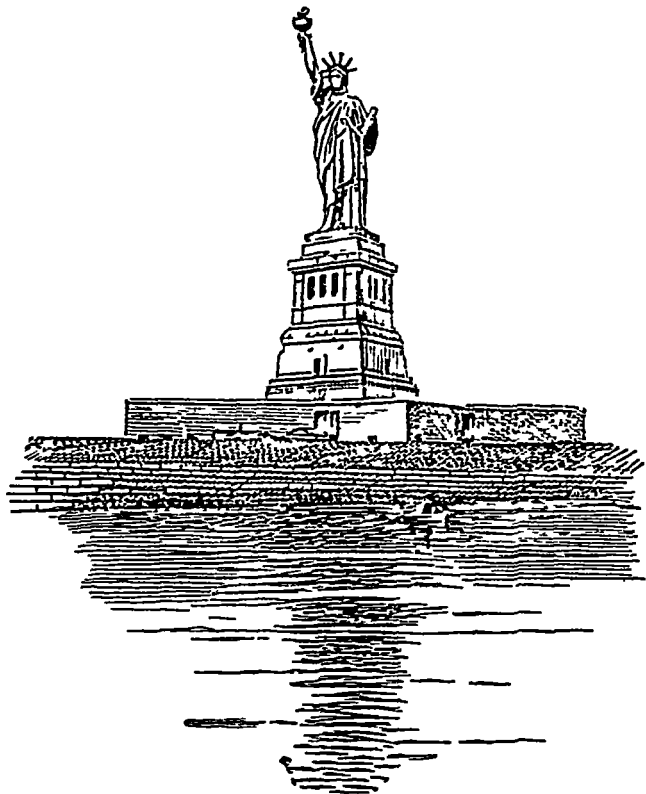


FIG 43 —THE STATUE OF LIBERTY—NEW YORK HARBOUR  
(See p 78)

London Apart from its huge financial and mercantile pursuits, the chief business of New York is to clothe and feed its vast population, while the outer suburbs specialise in making articles of luxury, such as jewellery



**San Francisco.** On the Pacific borderland of the United States are two parallel ranges of mountains separated by broad valleys. The mountains nearest the sea are called the Coast Range. In this range is an important gap called the **Golden Gate**, which is the entrance to the best harbour on the west side of the States. The port is San Francisco. Farther inland are the Sierra Nevada and the Cascade Ranges, which are more lofty than the Coast Range, rising boldly on the east to the Great Basin, but descending gently to the Pacific plains of the west.

Between the Sierra Nevadas and the Coast Range is the **Great Valley** which is drained by the Sacramento and San Joaquin, these rivers unite and enter the sea through the Golden Gate. The San Joaquin Valley is one of the great agricultural basins of the world. It is 250 miles long by about 50 miles wide. In it grows half the wheat raised in California, and here too may be seen acres of lucerne, vast vineyards, and astonishingly large orchards of prunes, peaches, apricots, figs, oranges, lemons, and other Mediterranean fruits. It produces fabulous crops of asparagus, potatoes, beans, and melons, and is famous for its cattle, sheep, and hogs. California has a great lumber industry, most of the houses, except in the cities, are built of wood, water power is used for generating electricity both for lighting and power, there is no coal to be had, but petroleum is abundant. The Sierra Nevada mountains yield millions of dollars' worth of gold each year. It was the discovery of this precious metal in 1848 which caused the first great rush of people to California. The chief city on the Pacific coast is San Francisco. It is the western terminus of four transcontinental railways. From this port, trade is carried on mainly with Japan, China, Australia, New Zealand, and the coast ports of America.

**Ports with Artificial Protection.** Some inlets form good harbours if shelter is given by means of breakwaters. **Plymouth** at the mouth of the Tamar, and **Tynemouth** at the mouth of the Tyne are

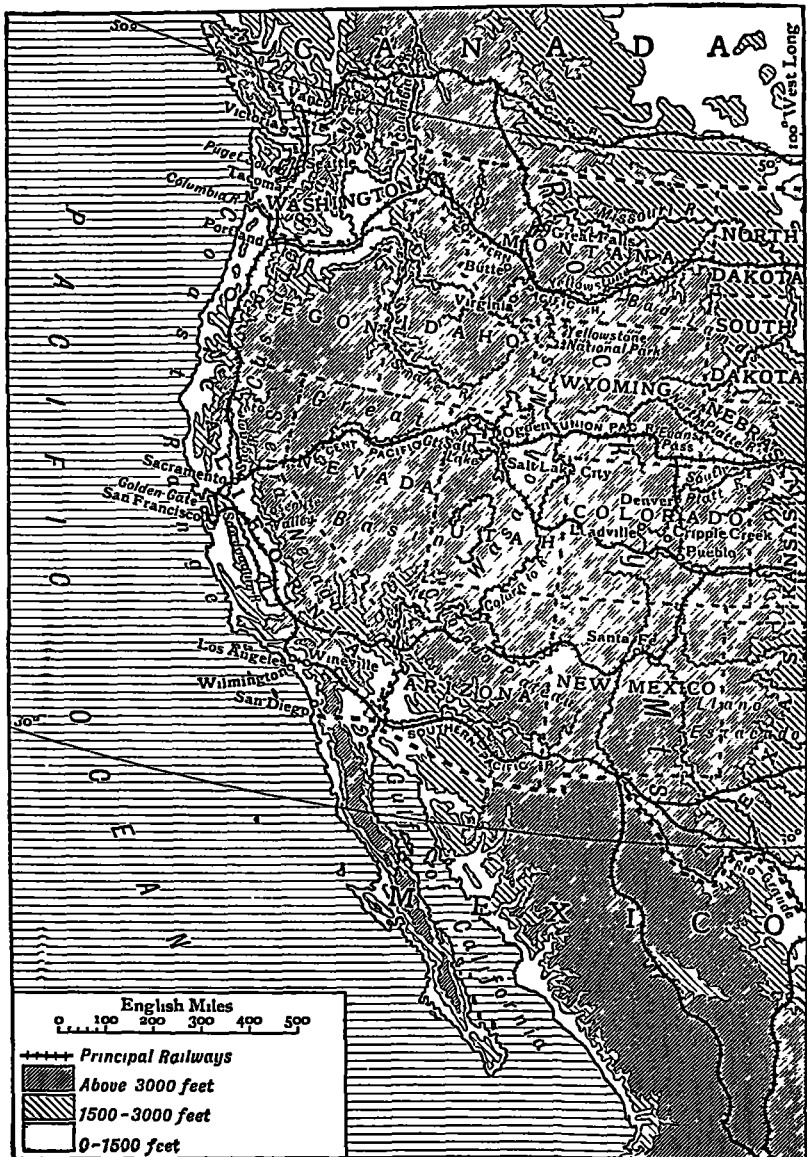


FIG 44—THE UNITED STATES—THE WESTERN STATES  
Note the situation of San Francisco

exposed to the storms of the sea, but the former has been supplied with a breakwater sheltering the mouth of the river, and the latter has the protection of piers across part of the river mouth. Sometimes it is necessary to have a port on a part of the coast without a natural harbour. In such a case, as at **Dover** and **Middlesbrough**, the harbours are artificially constructed of massive granite walls.

**Equipment of Ports** A port must offer much more than safe anchorage for ships. Cargoes must be dealt with, moved from and on to the vessels, and transported to and from the port. It is usually necessary to supply ports with docks, built near the river side, where vessels can rest untouched by the tidal movement of the water. Docks must be equipped with wharves, cranes, warehouses, and good road and rail communications. In these days, the docks of large ports are served by main roads and railways, thereby enabling material to be carried to and from the ships. Ships often need repair and equipment after a journey, and it is therefore necessary for the dock area to have workshops capable of undertaking that work. If the hull of a vessel needs cleaning, painting, or repairing, it must be placed in a dry dock, one from which the water can be pumped, in order to carry out that work. Thus it is seen that many things must be provided in order that a port may flourish.

**Ports as Manufacturing Centres** It is usually found that ports, in time, become manufacturing centres. This is particularly true of the temperate lands which receive raw material, such as sugar, oils, rubber, hemp, jute, cotton, wool, etc., from other lands. In order to save the expense of sending the material to inland places to be manufactured, factories are often built at the ports. Thus, soap works are usually at ports, since the oils and fats for soap manufacture come largely from overseas, and similarly, ports may have factories for the manufacture of sugar, of flour from wheat, rope from hemp, sacking from jute, rubber goods from raw

rubber, and jams from fruits Note again the industries connected with London, Fig 35

**Entrepôts** Entrepôts are ports which export material that they have imported They collect goods, not so much to supply an area of their own land, but in order to send them away again to other regions of the world **Singapore**, an island and seaport city at the end of the Malay peninsula, receives by small vessels the produce from the islands near by and exports it to many parts of the world Study Fig 77A again to note the position of the city The principal occupations depend upon the trade brought by hosts of small vessels that collect the products of the E Indies, liners call regularly, and there are docks for repairing and refitting London has a great entrepôt trade, for much of the material it receives is exported to those countries which are unable to import direct from the areas of production **Honolulu**, in the Pacific, the capital city and commercial centre of the Hawaiian or Sandwich Islands, collects material for export in the same manner as Singapore The products include sugar, rice, pineapples, bananas, tobacco, coffee, sisal hemp, and rubber, which are exported to an annual value of more than £25,000,000 Honolulu in the middle of the Pacific is a modern city with electric lighting and electric tramways, so greatly has it prospered in recent years as a commercial centre Entrepôts must be situated near large areas of production, or large areas of consumption

**Ports in Hot Lands** Many ports in the tropics are small, owing to the unhealthy conditions which prevail **Para**, at the mouth of the Amazon, exports half the Brazilian yield of rubber, **Accra**, on the Guinea Coast of Africa, exports gold dust, palm oil, ivory, rubber, gum, and timber, **La Guaira**, the chief seaport of Venezuela, stands on the Caribbean Sea, and exports coffee, sugar, cotton, cocoa, etc, **Callao**, the chief seaport of Peru, exports wool, hides, cotton, sugar, nitre, etc All these ports—Para, Accra, La Guaira,

Callao—are typical of many ports in hot lands, they are small towns although they are outlets for rich areas. They have low-lying situations in hot, wet areas, and are very unhealthy. They are the best examples of *purely commercial cities*, the industries associated with the ports of cooler lands being absent. In more healthy areas of the hot lands, ports such as Calcutta, flourish and grow big.

**The World's Largest Ports** The world's largest ports are the world's largest towns, and many have each a population of over a million inhabitants. Find the situation of each of the following ports on the map in the middle of the book.

Port	Population	Port	Population
Greater London	8,202,000	Shanghai	3,259,000
New York	6,930,000	Hankow	777,000
Chicago	3,376,000	Calcutta	1,486,000
Buenos Aires	2,215,000	Osaka	2,600,000
Leningrad	2,783,000	Rio de Janeiro	1,500,000
Philadelphia	1,950,000	Bombay	1,161,000

### Notes.

**Tides** are the regular rise and fall of the water of the ocean. Tides are most marked on the coast lands, and at the estuaries of rivers entering the open sea. The rise of the tide is called the flow, and the fall is the ebb. There are two tides in about 25 hours. At new and at full moon the tides with the greatest rise and fall, called the spring tides occur, and at the first and third quarter the tides with the least rise and fall are called neap tides.

**Fjords** (or **Fjords**) are sea inlets having a short entrance at right angles to the coast, and a longer arm parallel to it. They form excellent harbours, being deep and sheltered, but they are usually found in regions with difficult internal routes, so are of little commercial value.

**Dry dock**, one that can be filled with water or emptied at will. A ship enters when the dock is full of water, gates are closed, the ship is shored up, and some of the water flows out through the lock gate and the remainder is pumped out. Repair and renovation are then possible.

The Statue of Liberty on Bedloe's Island in New York harbour welcomes every incoming ship. No other statue is so high, to the top of the torch is 151 feet, not including the granite pedestal that is about the same height, the thumb of the figure is 12 feet in circumference, inside are elevators and stairways for ascent into the head, which can accommodate forty persons at a time.

### Exercises.

- 1 Explain, with examples, the following terms port, artificial harbour, dry dock, fiord, estuary
- 2 Name the chief ports of Great Britain
- 3 Give the situation of each of the following ports Hamburg, Antwerp, San Francisco, New Orleans, Shanghai, Singapore, Honolulu, Montreal, Osaka, Rio de Janeiro, Leningrad, Hankow
- 4 Give examples of ports situated on (a) river mouths, (b) fiords, (c) drowned valleys, (d) artificial harbours
- 5 Why do ports often become manufacturing centres? Give examples
- 6 What do you understand by entrepôt trade? Give examples
- 7 What natural conditions have helped to make great commercial centres of (a) New York, (b) Glasgow?
- 8 Write an explanation of the map, Fig 38
- 9 Why have commercial towns in hot lands generally but few manufactures? Give examples
- 10 State what you know of San Francisco under the following headings latitude, contours, rivers, railways, distance from Vancouver (Use Fig 44)
- 11 Explain the map, Fig 42, in reference to the trade facilities of New York with Canada and Chicago
- 12 Describe the route of a cargo of wheat from Port Arthur to England in (a) summer, (b) winter (Use Fig 38)

## CHAPTER VII

### THE ATLANTIC HIGHWAYS

**Coaling Stations**—One of the chief requirements of the modern ship is coal. Notice on Fig 45 the situations of the ports at which vessels can replenish their supplies of coal. These ports are often far removed from the coalfields of the world, and their stores of

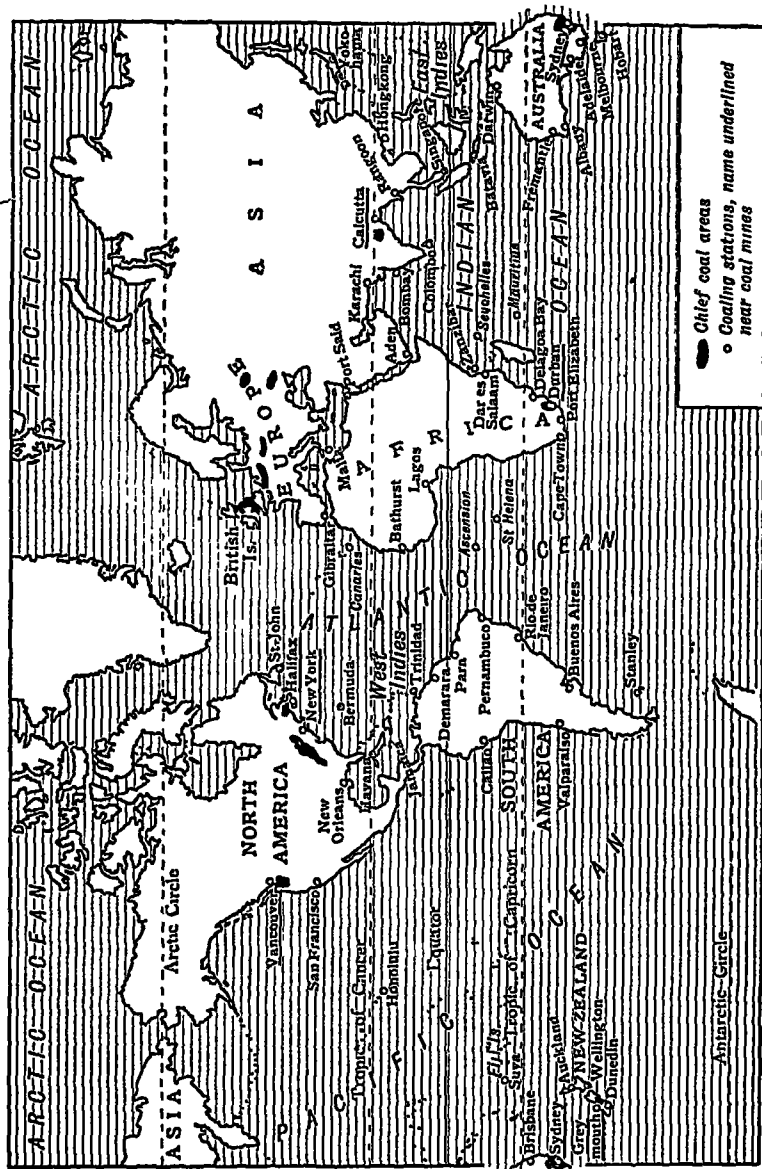


FIG 45—THE WORLD'S CHIEF COALING STATIONS AND COALFIELDS

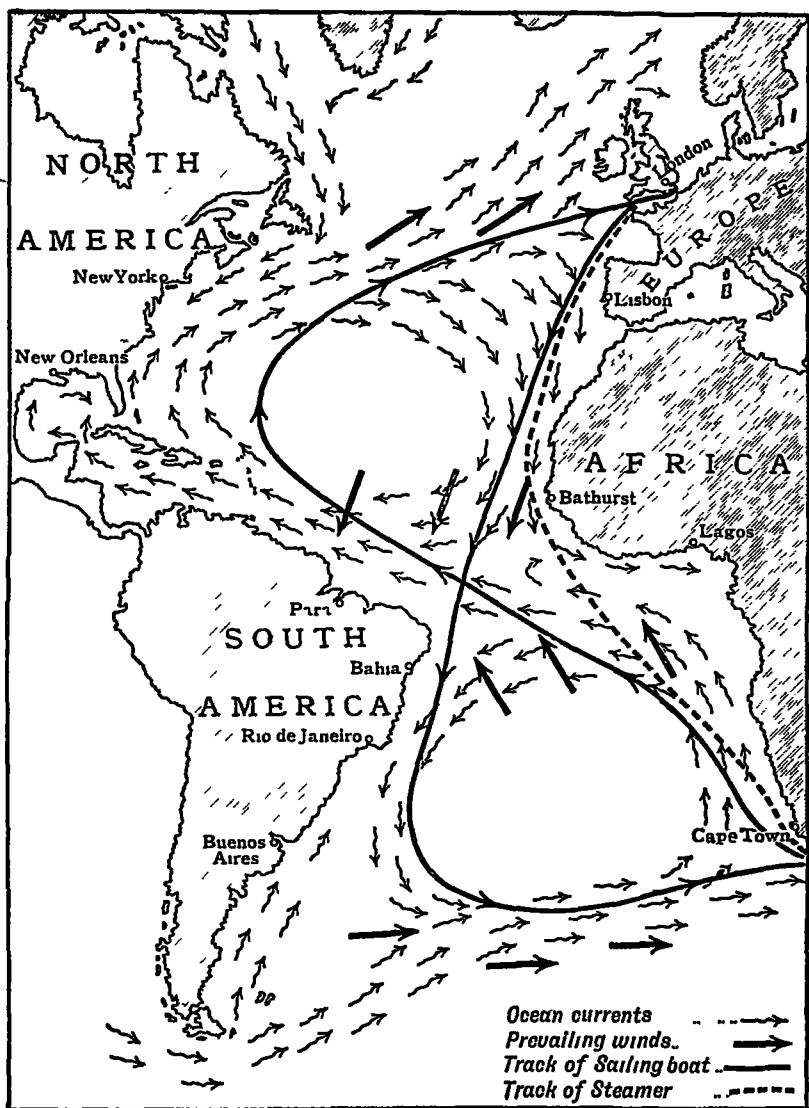
coal must be taken to them from those areas which are able to export it. South Wales supplies many of the coaling stations, the vessels which take out the coal return with whatever cargo they can secure. The map shows that North America, North Europe, South Africa, Australia, and New Zealand can supply vessels with coal from their own coalfields, but that South Europe, North Africa, and South Asia must receive supplies from other countries.

It should be noticed that there must be many coaling stations on an ocean highway, in order that the least amount of space on vessels may be given up for the storage of coal.

**Routes of Ships** The routes traversed by ships are usually determined by the question of *time*. The chief idea is to finish a journey in the shortest time, and thus incur the smallest outlay. A steamer takes the least time if it covers the shortest possible distance between two ports, and the shortest distance will be the route used, providing that there is no dangerous water in the path. During the summer months, for instance, vessels crossing the North Atlantic from Liverpool to Montreal can travel farther north than is possible in winter and early spring, when icebergs are a source of great danger.

A sailing boat must make every use of wind and current, and it has to take a different route from that of a steamer, which is self-propelled. The result is, that the path of the sailing boat is longer than that of a steamer travelling between the same two ports, but it is the path taking the least *time* possible for the sailing boat. The trade winds of the tropics, the westerly winds of the temperate zones, and the monsoon winds of the Indian Ocean are of great advantage to sailing ships. Notice on Fig 46 the paths of steamers and sailing boats from London to the Cape of Good Hope. Here it is seen that the shortest journey lies near the coast of Africa, and that the sailing boat crosses the Atlantic *twice* on the





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FIG 46 — THE ATLANTIC ROUTE FOR STEAMERS AND SAILING BOATS FROM LONDON TO THE CAPE

journey In each case the journey is the shortest in point of view of time

**Tramp Steamers and Liners.** The steamers of the ocean fall easily into two distinct classes, the tramps and the liners The former are built wholly for cargo, and the latter mainly for passengers The tramps do the bulk of the world's carrying trade, and are responsible for the transport of most of the material from one country to another They are ready to go to any port where a cargo can be obtained Thus, a boat may take out a cargo of coal to South America, where it picks up material for Ceylon At Colombo, the port of Ceylon, it obtains goods for Australia, and in this way goes from one port of the world to another before it finally returns laden with goods for the home country

The liners are the fastest and most luxurious vessels afloat They carry the mails from one country to another, and, although the accommodation for passengers is the first concern, some of the space is reserved for material They run to a time table, just like a train, and are always quoted in the shipping lists of the daily papers

**Coasters** A large number of the ships engaged in commerce make only short journeys along the coast of a country, or from one land to its near neighbours Thus, boats sail regularly between London and Newcastle, London and Aberdeen, London and Antwerp, Hull and Hamburg, Newcastle and Hamburg These boats do not use the ocean highways, but their share in the trade of the world is very considerable In the island groups of the world, such as those of the Pacific, the *total* produce is important, although each separate island has only a small output Coasters gather the produce of the region and take it to the most convenient point that can be developed as a port for the ocean traders Honolulu, Apia, and Suva have developed into important entrepôt ports in the Pacific, by the help of coasters In Fig 47 are shown the routes from London to the Continent

**Cold Storage** Many of the materials carried across the ocean are perishable. This is specially true of meat, fish, butter, and fruits. Some of these things are carried thousands of miles, and then journey often lies partly in the hot tropical belt of the earth.

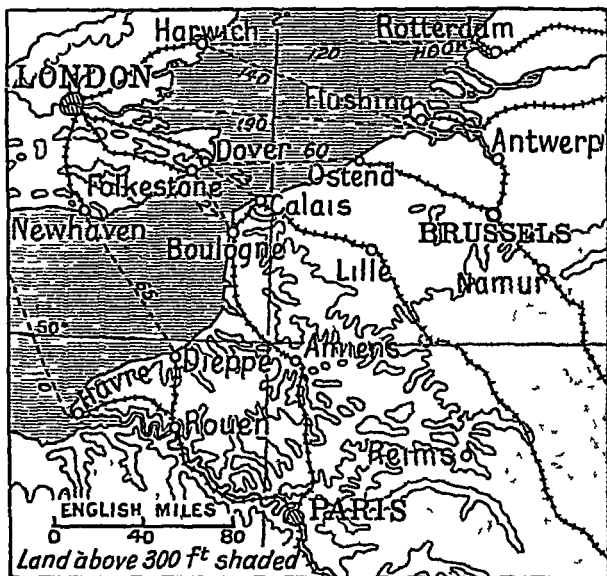


FIG 47—ROUTES FROM LONDON TO THE CONTINENT

Perishable materials could not be transferred from one region to another without cold storage, or some other method of preventing decay. Many vessels are equipped with machinery which can lower the temperature of the holds, in which the material is stored, to such an extent as to keep the contents sound and fresh. When the ships are unloaded, the goods, until required, are placed in warehouses which are similarly kept cold, and in this way decay is prevented.

We are thus able to have New Zealand lamb and butter, Australian mutton and butter, Argentine beef, and much other perishable material from distant lands

**North Atlantic Route** The North Atlantic route has the trade between Europe and North America Notice on Fig 49 the chief ports sending ships along the route On the eastern side we have

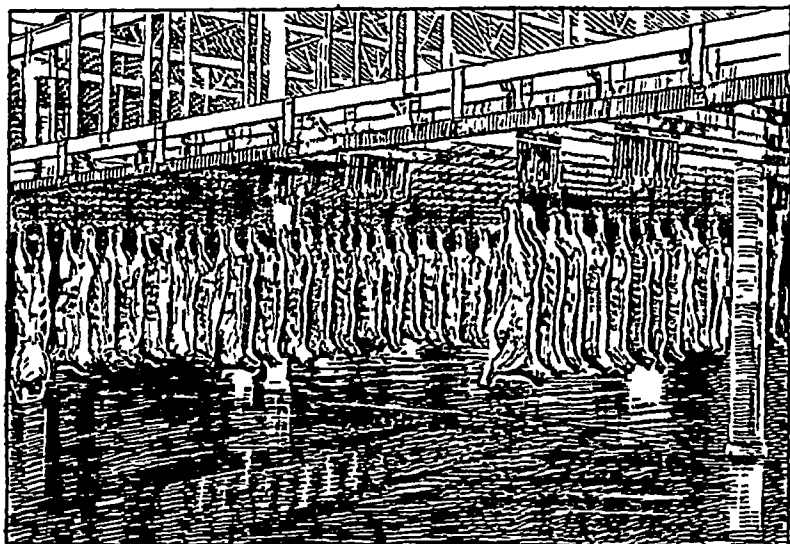


FIG 48 —INTERIOR OF FREEZING WORKS—NEW ZEALAND MUTTON

London, Liverpool, Glasgow, Southampton, Hamburg, Antwerp, Havre, and Rotterdam, and on the western side Montreal, Halifax, Boston, New York, Philadelphia, Baltimore, Charleston, Mobile, New Orleans, and Galveston

The shortness of the route, and the abundance of coal at each end, make intermediate coaling stations unnecessary This is fortunate, since on the route there is a remarkable absence of islands at which coal could be stored

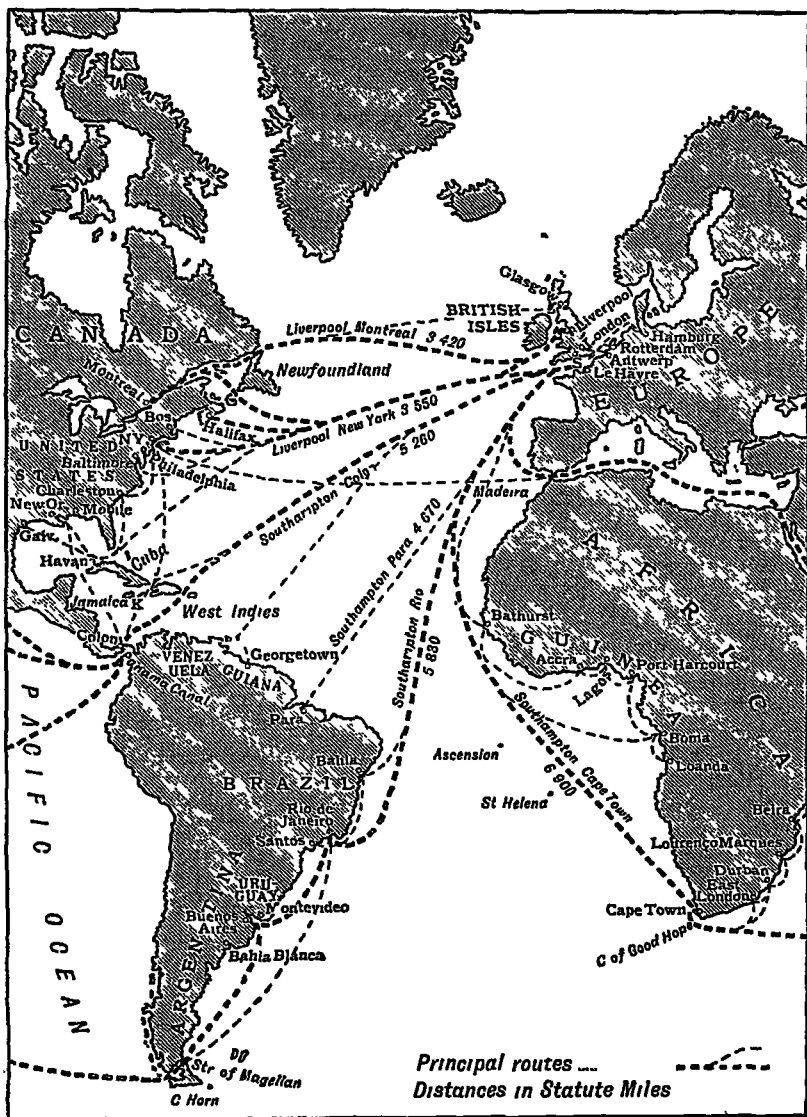


FIG 40—TRADE ROUTES OF THE ATLANTIC

The fastest boats make the journey in about five days, but a week is the average time taken in crossing. The liners using the route are the largest, fastest, and most luxurious ships ever built, and great numbers of passengers are carried (See Fig 19)



FIG 50 —PLOWING THE PRAIRIE

Wheat is one of the chief cargoes of the North Atlantic Route

The chief commodities (moving east on the route) are Canadian wheat, timber, wood pulp, cheese, bacon, fish, furs, and fruits, and American cotton, tobacco, wheat, maize, petroleum, tinned meats and tinned fruits. Europe sends mainly manufactured goods to the west.

**South Atlantic Route.** The South Atlantic route is the link between Europe and South America, Central America and the West Indies. The distance from Western Europe to the West Indies is

about 4000 miles, and to the mouth of the La Plata about 6300 miles. The journey to Buenos Aires from London takes about 20 days. Notice on Fig 49 the chief ports engaged on the route. On the European side we have the ports already mentioned in the previous route, and on the American side Havana in Cuba, Kingston



FIG 51—LUMBER JAM IN CANADA

Timber and Wood Pulp are largely exported from Canada

in Jamaica, Georgetown, Para, Bahia, Rio de Janeiro, Santos, Montevideo, Buenos Aires and Bahia Blanca in South America

The W Indies, Central and South America are deficient in coal, thus coaling stations have to be established, mainly with British coal. Pick these out on Fig 45, which shows the coaling stations of the world

The South American route deals mainly with material, and only

to a minor degree with passengers By the route to Europe are conveyed the spices, tobacco, and fruits of the W Indies, coffee and rubber from Brazil, wheat, maize, and meat foods from the Argentine and Uruguay, cocoa and sugar from Venezuela, Ecuador, and the Guanas The material carried west is mainly coal, and the produce of the factories—textiles, machinery, etc

**Routes to Africa** Trade with the western and south-western sides of Africa takes place along the eastern side of the Atlantic Notice the route on Fig 49, and pick out the trading ports These

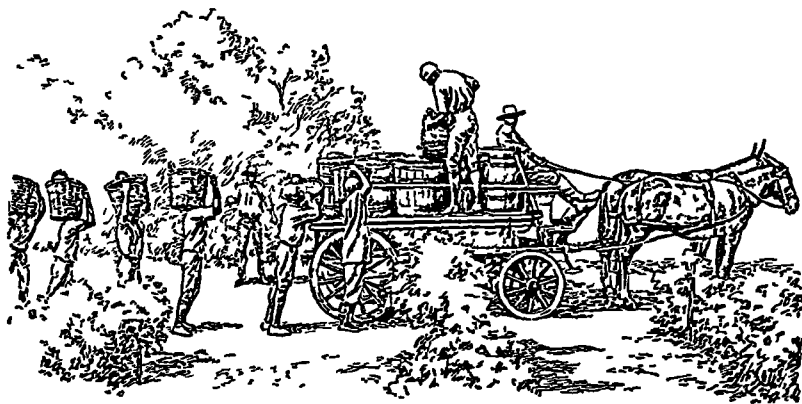


FIG 52—THE HARVEST IN A CAPE VINEYARD

are Accra and Port Harcourt on the Guinea Coast, Cape Town, East London, Port Elizabeth, Durban, Beira, and Lourenço Marques

The distance from Southampton to Cape Town is about 6900 miles, and the average time taken is 17 days Coaling stations are necessary These have been established at Madeira, St Helena, Ascension, and Cape Town Boats trading with the Guinea Coast can also coal at Bathurst and Lagos

The African produce carried along the route is mahogany, cotton, cocoa, ivory, rubber, and palm oil from the Guinea Coast and the Congo, fruits, wool, wheat, mohair, copper, gold, diamonds, and



ostrich feathers from the Cape Europe sends coal and manufactured goods to Africa

The Cape of Good Hope route is the oldest of the ocean trade routes Cape Town is a meeting-point of routes from many directions, it is situated at the corner of Africa which must be passed by all vessels travelling to Asia or Australasia by this route

The Cape route is really a group of routes rather than a single route From all ports on the Atlantic, routes meet at the south-west corner of Africa, and then diverge to East Africa, Asia, and Australasia The largest traffic that rounds the Cape is that dealing with Australia, although, from European ports, the distance is 1000 miles longer than *via* the Suez Canal. This longer route is chosen in order to avoid canal charges

### Notes.

**Coaling Station**, a port of call lying on an ocean trade route, equipped with supplies of steam coal usually obtained from a distant coalfield Ships calling at these stations are thus able to replenish their stocks of fuel South Wales and New South Wales (Australia) supply most of the stations with coal, and the majority of the world's coaling stations are under the control of the British Government

**Coasters** are vessels which ply their trade between ports in the same country "along the coasts"

**Ostrich Farming** is an important industry of the Karroos of South Africa, although the trade in feathers is less important than formerly, as ostrich feathers are not now largely used in ladies' dress To get the best feathers a desert climate is required, and abundance of nutritious food Lucerne is the best food for producing good feathers An ostrich farm is enclosed by a strong wire fence, and is usually divided into camps of various sizes There are large open runs of 2,000 acres or more, in which the ostriches can roam at will For plucking, the ostriches are driven into a strongly made wooden plucking box, where they have no room to kick There is no plucking really, no pain is inflicted, for the quills are cut and the root is left in the bird, where after a time it withers and comes out like the hair on our heads, without hurting

**Mohair** is the fibre obtained from the coat of the Angora goat which flourishes on the plateaus of Asia Minor and the Karroos of South Africa. The fibre is mostly exported to Bradford for manufacture into clothing material.

### Exercises

1 What is a coaling station? Make lists of the coaling stations in the Indian Ocean, Atlantic, and Pacific respectively (Use Fig 45)

2 Describe the route of a sailing ship from London to Cape Town and back (Use Fig 46)

3 Explain the following tramp, liner, coaster, cold storage

4 Name the British and the European ports on either side of the North Sea

5 Name some of the chief exports of New Zealand, Australia, Argentina, W Indies

6 In what respects have the British Isles a good position for trade?

7 Name the coaling stations on the route from London to Cape Town (Use Fig 45)

8 Give the situations of the following ports Havre, Halifax, Galveston, Havana, Santos, Accra, Boma, Beira

9 What ports on the Atlantic coasts are in the tropics?

10 What tropical regions export commodities to Britain by the Atlantic routes?

11 What will be the chief goods conveyed by vessels to Britain from (a) Montreal, (b) West Indies, (c) Cape Town?

## CHAPTER VIII

### THE INDIAN AND PACIFIC HIGHWAYS

**The Suez Routes.** The Suez Canal is a great ship canal nearly 100 miles long, cut through the narrow isthmus which joins Africa with Eurasia. The canal crosses three lakes, *viz*, Balah, Timsah, and the Bitter Lakes. It is of great commercial importance to the British Empire, for it is the main highway between Britain and India, Australia, and other eastern parts of the Empire. At the Mediterranean entrance of the canal is **Port Said**, a busy coaling station, and at the Red Sea entrance is the Arab town of **Suez**.

These towns are joined by rail, there is also a railway to Cairo from Ismailia, about midway along the canal. At the entrance of the canal at Port Said is a statue of the French engineer, M Ferdinand de Lesseps, who designed and directed the making of the canal, which was opened in 1869 (Fig 53)

Find on Fig 77A the following ports, and notice the distances from Southampton and the times taken on the journeys

Port	Time	Distance
Gibraltar - - - - -	4 days	1,320 miles
Malta - - - - -	8 "	2,450 "
Port Said - - - - -	12 "	3,530 "
Aden - - - - -	16 "	5,130 "
Bombay - - - - -	21 "	7,030 "
Colombo (Ceylon) - - - - -	23 "	7,500 "
Calcutta - - - - -	28 "	8,980 "
Singapore - - - - -	28 "	9,350 "
Shanghai - - - - -	38 "	11,980 "
Yokohama - - - - -	45 "	12,870 "
Melbourne - - - - -	40 "	12,560 "
Wellington - - - - -	46 "	14,080 "

*Note* By Cape Horn the distance from Southampton to Wellington is 13,660 miles, and by the Panama Canal it is 12,880 miles (See Fig 77A)

The Suez route, in some measure, serves all the lands of the world except South America, and serves 75 per cent of the world's population. Notice that North America, from its eastern ports such as New York and Boston, uses the Mediterranean Sea and the Suez Canal to reach the southern part of Asia.

The route is the world's highway, and may be considered as one great trunk line with a large number of important branches. The main line starts from a European port, such as London, Southampton, etc., and passes Gibraltar, Malta, Port Said, Suez, Aden, Colombo, Singapore, Hong Kong, Shanghai, and Yokohama. The chief branches are to countries of southern Europe and northern Africa, from Aden to East Africa, from Aden to Australasia, from Aden to

Persia, Karachi, or Bombay, from Colombo to Madras, Calcutta, or Rangoon, from Singapore to the Philippine Islands

Notice that the route is comparatively near land during the whole of its length, and that important areas of production lie near to it throughout the whole of its course

It will be of service to learn a few facts about some of the chief ports of call on the main Suez route

Gibraltar, a town and rock fortress at the southern extremity of Spain is a British possession. The rock juts out into the Mediterranean as a narrowing peninsula ending in Europa Point. It is joined to the mainland by a narrow isthmus,  $1\frac{1}{2}$  miles long. The newly-constructed mole, or breakwater, affords anchorage for the largest vessels. The town is of great importance as a coaling station, and the harbour can accommodate the British Mediterranean Fleet. On the opposite side of the Straits of Gibraltar (9 miles wide at its narrowest point) are the African shores of Morocco with the ports of Tangier and Ceuta.

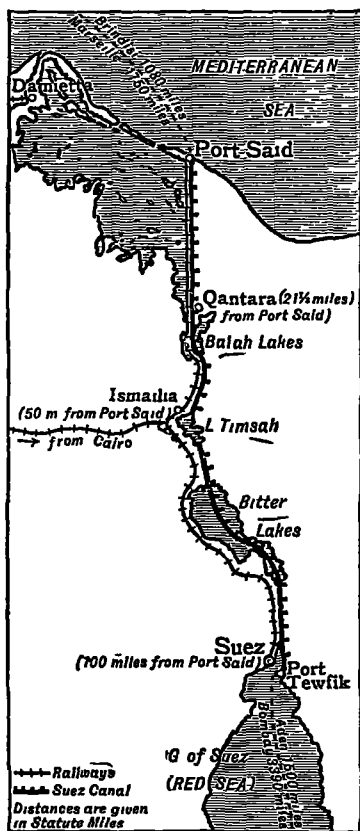


FIG 53 —THE SUEZ CANAL

Malta, an island of the Mediterranean, is a British possession. It lies about 60 miles from the southern shores of Sicily, and 180

miles from the African coast It is an important British naval base and coaling station, with an extensive dockyard and arsenal The surface is a succession of hills and valleys, the coast (except in the south) is deeply indented, Valletta, the capital, stands on a fine double bay The chief products are oranges, lemons, and other fruit, potatoes and onions Malta is specially noted for its honey and lace

Aden is a town and territory in the south-west corner of Arabia, near the southern entrance to the Red Sea The town is built on a volcanic peninsula of the same name, and is an important and strongly fortified naval and coaling station The climate is hot, but not unhealthy, water is very scarce, and most of it is obtained by condensation of sea water, all foodstuffs have to be imported, there are two salt works, and much salt is exported

The Red Sea, an arm of the Indian Ocean, occupies the trough of a portion of the Great Rift Valley between Arabia and north-eastern Africa It extends from the isthmus of Suez for 1200 miles to the Strait of Bab-el-Mandeb The width varies from 100 to 200 miles, the coasts are fringed with coral reefs, and lined by sandy deserts The sea journey through the Red Sea is very trying, for the air is hot and humid From earliest times the Red Sea has been used as a highway for vessels, it was crossed at the northern extremity by the Israelites in their exodus from Egypt

Colombo is the capital and chief port of Ceylon It has a large artificial harbour and is a first-class port The town is lighted by gas and electricity, there are

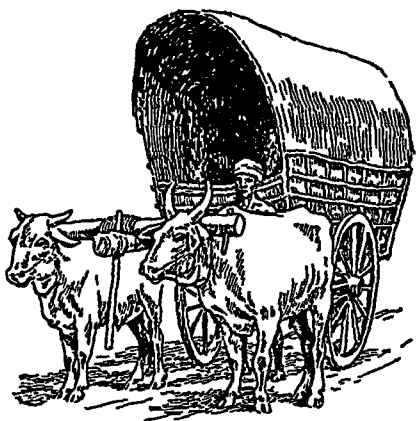


FIG 54 —BULLOCK CART—COLOMBO

electric tramways, and the water supply comes from a reservoir in the hills 30 miles distant. There are parks, hospitals, two cathedrals, large hotels, factories, stores, government buildings and fine residences, so that Colombo has all the advantages of a modern European town. The population includes Parsees, Tamils, Malays, and descendants of the Portuguese and Dutch.

**Singapore**, the chief British possession in the Straits Settlements, is an island and seaport city. The island, 27 miles long and 14 miles



FIG 55 — RICKSHAW

wide, is situated off the extreme end of the Malay Peninsula. Liners call regularly at Singapore, and hosts of small vessels, Malay sampans, and curious Chinese sailing craft, collect the products of the East Indies and bring them to Singapore for re-export. Gutta-percha, copra, and many other tropical products are obtained from the forests and plantations of the Malay Peninsula, but the chief product exported is tin, for the mountains running through the peninsula and re-appearing as islands in the south, contain the

richest supplies of this metal in the world.

Singapore is the place where the East and West meet more freely than at any other spot in the world, but more than half the population is Chinese. There are 10,000 rickshaws in use there, and these carry people of all nations to and from the landing-place and the town. Being within two degrees of the equator the climate is hot and moist, all seasons are wet in Singapore, and there are 180 rainy days in an average year.

**Hong Kong**, a British possession, is a small island lying at the entrance of the Canton river of China. It is an important distri-

buting centre for nearly one-third of China's foreign trade The harbour, one of the finest in the world, ranks fifth in respect of tonnage entered and cleared The number of vessels, great and small, using the port is probably greater than the number using any other port in the world, their cargoes include tea, silk, ivory, opium, betel-nut, coal, petroleum and many other things The streets of Victoria, the official title of the settlement, rise in terraces up the



FIG 56 — A CHINESE VILLAGE

sides of Victoria Peak, which dominates the harbour Everywhere along the shores are strings of houseboats and rafts, where live the Chinese "*floating population*" There are industries of cotton-spinning, sugar-refining, ship-building, rope-making, stone-quarrying, and important fisheries

Shanghai, a seaport of China, stands about 12 miles from the Yangtze estuary, on the edge of a low, flat, intensively cultivated area The native quarter is surrounded by walls, the harbour extends for six miles along the river, the European quarter has

splendid shops and houses, broad streets, and many trees, the Chinese quarter is unbelievably dirty and squalid. Along the wide Bund or waterfront, are seen European taxi-cabs, carts drawn by Mongolian ponies, Chinese rickshaws, sedan-chairs and wheelbarrows, all awaiting their fares. The productiveness of the surrounding country and its strategic position at the mouth of China's greatest river, makes Shanghai one of the most important seaports in the Far East. Railways extend inland, and 40 miles distant is



FIG 57—JAPANESE PEASANTS TRAVELLING

China's great north to south waterway—the Grand Canal. By these routes come tea, rice, wheat, wool, cotton, silk, beans, and hides for export, cotton, yarns, cloth, coal, sugar, metals, machinery, and oil are imported.

**Yokohama**, the principal seaport of Japan, stands on Tokyo Bay, 15 miles from Tokyo, the capital city. It has a large harbour protected by artificial breakwaters. In 1923, the city was almost destroyed by an earthquake. Yokohama

handles the bulk of Japan's shipping, silk, copper, tea, fish, paper, toys, and manufactured goods of all sorts pass through the port, and to it foreign vessels bring sugar, textiles, oil, etc. Ships and merchant vessels of every nation are seen in the harbour, travellers and sailors from all parts of the world are found along the Bund, in the bazaars, theatres, and shops.

**Coaling Stations** Numerous coaling stations are required on the Suez route, as most of the countries bordering the route are deficient in coalfields. As far east as Colombo, the coaling ports are supplied with British coal from the South Wales coalfield.

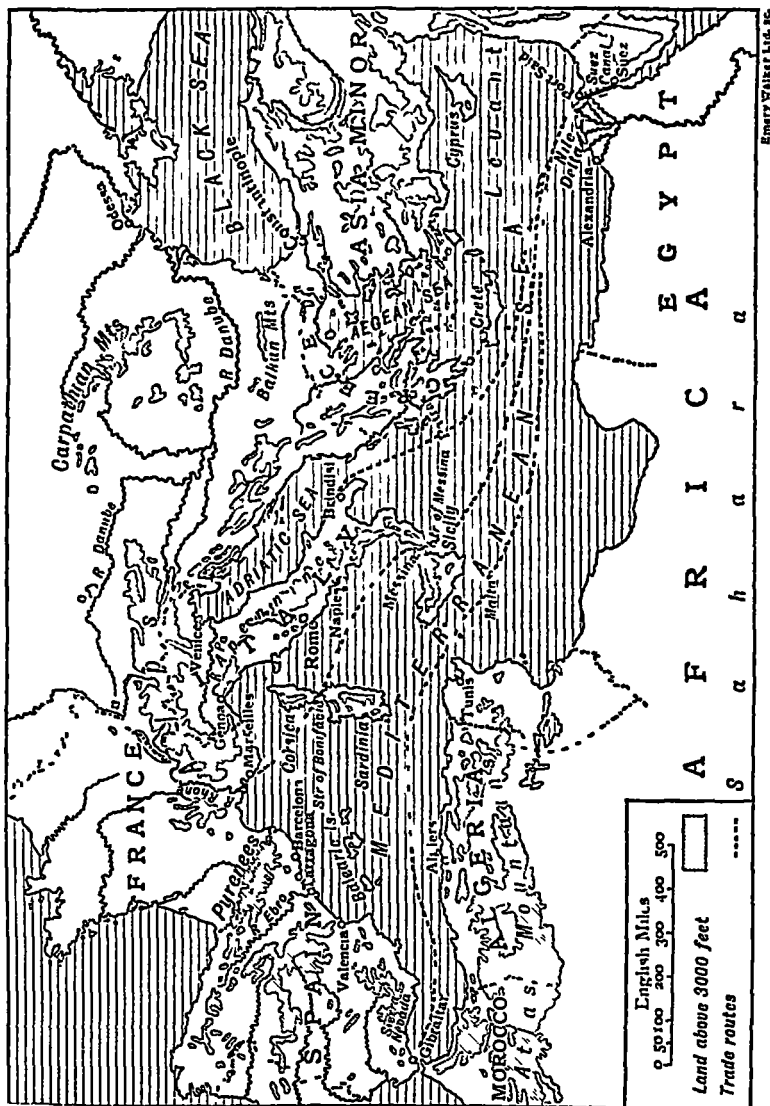


To the east of Colombo, the other ports at which coal is stocked are supplied from Newcastle near Sydney in Australia

Pick out the coaling stations on Fig 45 and notice the number of times that a boat can obtain coal on the long journeys from London to Japan, and from London to New Zealand Notice, also, that the coaling stations have been established at those points on the route which will have the largest volume of traffic, that is, at the straits leading to seas, and at the entrance to the canal Colombo is also a coaling station because all boats travelling across the Indian Ocean in the Asiatic trade must pass near the south end of the Island of Ceylon At that part of the route, therefore, the most suitable spot exists for the establishment of a coal depôt

**Mediterranean Trade** The Mediterranean lands enjoy a peculiarly warm and equable climate, partly because of the influence of the sea, and partly because the lands are to a large extent protected from the north winds by the Balkans, Alps, Pyrenees, and other mountains The principal products are grapes, dried fruits, and wine olives, mulberries, oranges, lemons, figs, almonds, and dates These products are in demand in Western Europe, and give rise to an important trade Many ports at which these products can be shipped are situated on the shores of the Mediterranean Sea The ports named in the following table should be located on Fig 58, and the special products noted

Port			Country	Products
Valencia	-	-	Spain	wine and fruit
Tarragona	-	-	"	wine and fruit
Barcelona	-	-	"	wine and fruit
Marseilles	-	-	France	olives, silk goods
Naples	-	-	Italy	mulberries, wines
Genoa	-	-	"	mulberries, wines
Messina	-	-	"	lemons
Patras	-	-	Greece	currants
Odessa	-	-	Russia	grain
Alexandria	-	-	Egypt	cotton
Tunis	-	-	Tunisia	dates
Algiers	-	-	Algeria	fruit



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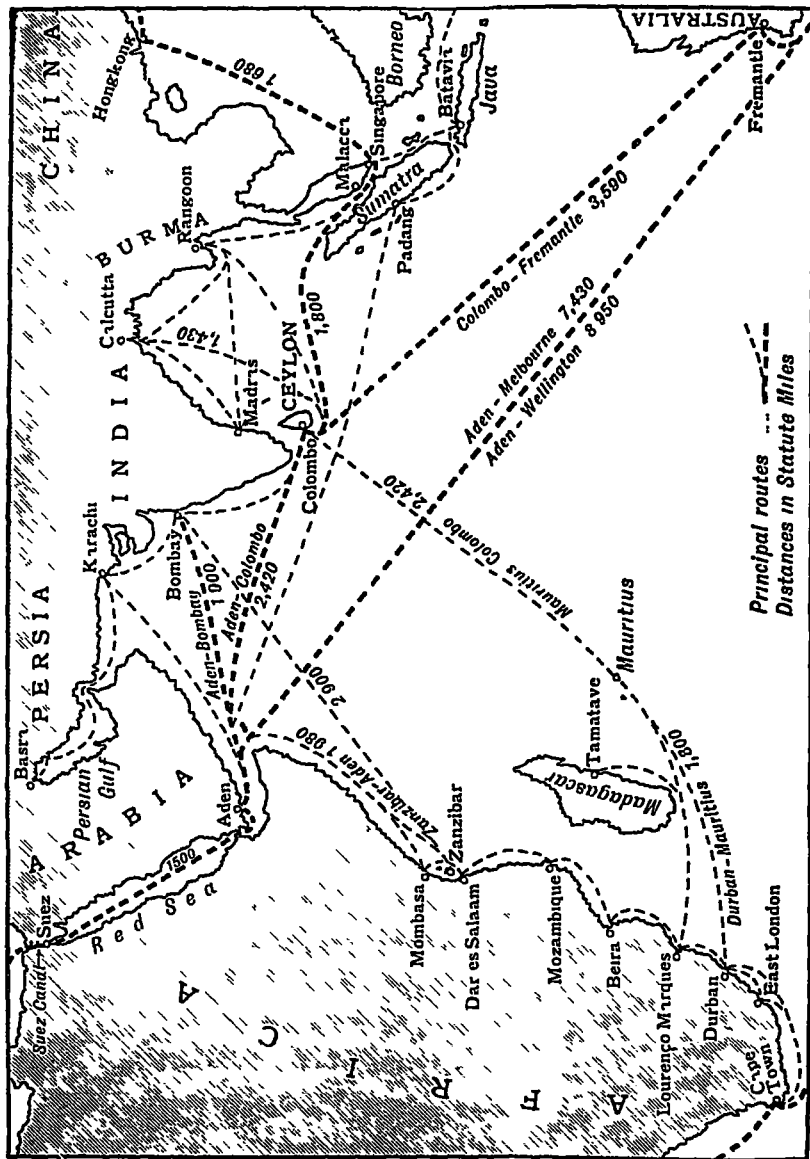
FIG 58.—THE MEDITERRANEAN SEA  
Note the main Trade Routes and Ports

**Asiatic Trade** The monsoon lands which stretch from India to Japan, and the islands which lie off south-east Asia, are regions of great agricultural wealth. Here the heat is great and the rainfall plentiful, man has only to scratch the surface of the earth, sow his seeds, and sit down to watch the plants grow. The products cultivated include tea, rice, coffee, spices, rubber, hemp, jute, indigo, opium, cotton, wheat, oil-seeds, sugar, and coconuts. In addition, it is the chief area of the world for tin, teak, camphor, silk, soya beans, and bamboo. The south-eastern portion of Asia contains half the people of the world, the bulk of whom are peasant farmers. The output of material is enormous. Large numbers of vessels are engaged in carrying the productions to other lands, and in taking to Asia railway material, cotton goods, and varied manufactures.

Find on Fig 59 the following ports, and notice the chief products exported from each

Port		Country	Products
Karachi -	-	India	wheat
Bombay -	-	"	cotton, sugar
Colombo -	-	Ceylon	spices, rubber, tea, copra
Calcutta -	-	India	tea, jute, hemp, rice, indigo, sugar, oil seeds
Rangoon -	-	Burma	rice, teak
Singapore -	-	Straits Settlements	tin, fruits, rubber, coco nuts

**Calcutta**, a densely populated city, and formerly the capital of the Indian Empire, extends for 6 miles along the left bank of the Hooghly. Being on a navigable river 86 miles from the sea, and having numerous docks and warehouses, it is the gateway and great clearing house of trade of the rich valleys of the Ganges and Brahmaputra, with which it is joined by railways and waterways. It is the terminus of several trunk railways, and with Howrah, an industrial city on the opposite bank of the river, it has a population of over 1,400,000. Nearly four hundred races and castes are represented



in the population There are jute mills, flour mills, oil mills, tanneries and rice mills The principal home industries are the making of pottery and brass ware Calcutta has extensive parks, notably the Maidan, handsome public buildings, a university and numerous colleges and schools

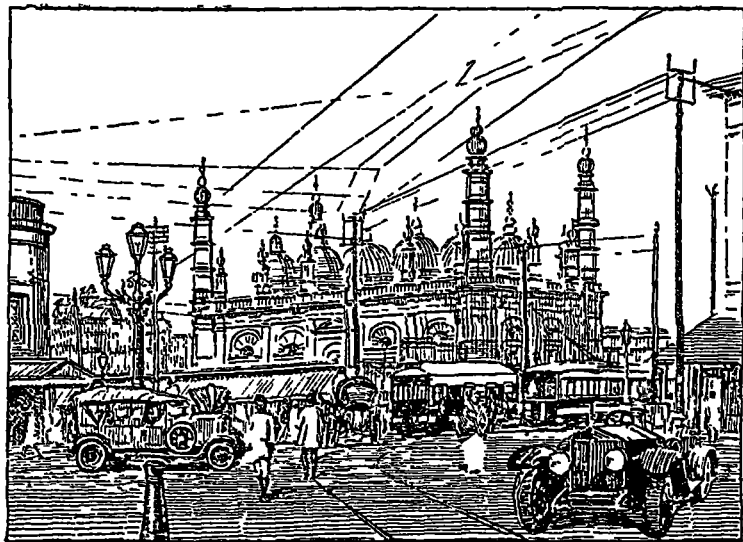


FIG 60—CALCUTTA

The city of **Bombay**, the capital of the presidency of Bombay, and the chief seaport of western India, is *the gateway to India* Its harbour is one of the finest natural shelters in the world The city itself is on a small island, but causeways and breakwaters join it to the mainland, so that it is almost a peninsula Bombay is the second largest city in India, it is the terminus of the Great Indian Peninsula Railway and other lines, it has important cotton mills, for Bombay is the great cotton market of western India There are many educational and medical institutions, municipal offices



and markets, libraries, public offices and other important buildings, such as are seen in large western cities. The native city has its network of narrow streets and crowded bazaars, as in most cities of India. Here the native craftsmen ply their trades—jewellers, metal workers, wood carvers, etc. Between the hills rise the five Towers of Silence, where the Parsees deposit their dead to be devoured by vultures. The Parsees are the richest and most influential of the native peoples.

**Rangoon**, the capital of Burma, lies on the Rangoon river about 21 miles from its mouth. Railways join it with Moulmein, Mandalay, Prome and other large towns. It is the main export centre for the great Burmese rice fields, other exports are teak, raw cotton, petroleum, and hides. The Shwe Dagon Pagoda is one of the greatest pilgrimage shrines of Buddhism. (Fig 61)

**Australasian Trade** The products of Australasia available for export are mainly wool, mutton, wheat, butter, cheese, tallow, skins, copper, gold, tin, and silver. The chief ports engaged are, Sydney, Melbourne, Brisbane, Adelaide, Fremantle, Wellington, Lyttelton, and Auckland. The imports of Australasia are manufactured goods. The shortest route to Australia is *via* the Suez Canal, but the Panama Canal route is the shortest way to New Zealand. Notice on the map, Fig 77A, the distance from London to Sydney and Wellington by the routes *via* Suez, the Cape of Good Hope, and Panama.

**Sydney**, the capital of New South Wales, is the chief fortified naval station of the Commonwealth, and the principal commercial and shipping centre of the South Pacific. It extends along the shores of Port Jackson, one of the finest natural harbours in the world. As the harbour is a *drowned valley*, there are no large rivers bringing down silt, and there is a great depth of water. There are 23 miles of docks and every facility for storing and loading grain and other products. Here cargo boats and ocean liners from every

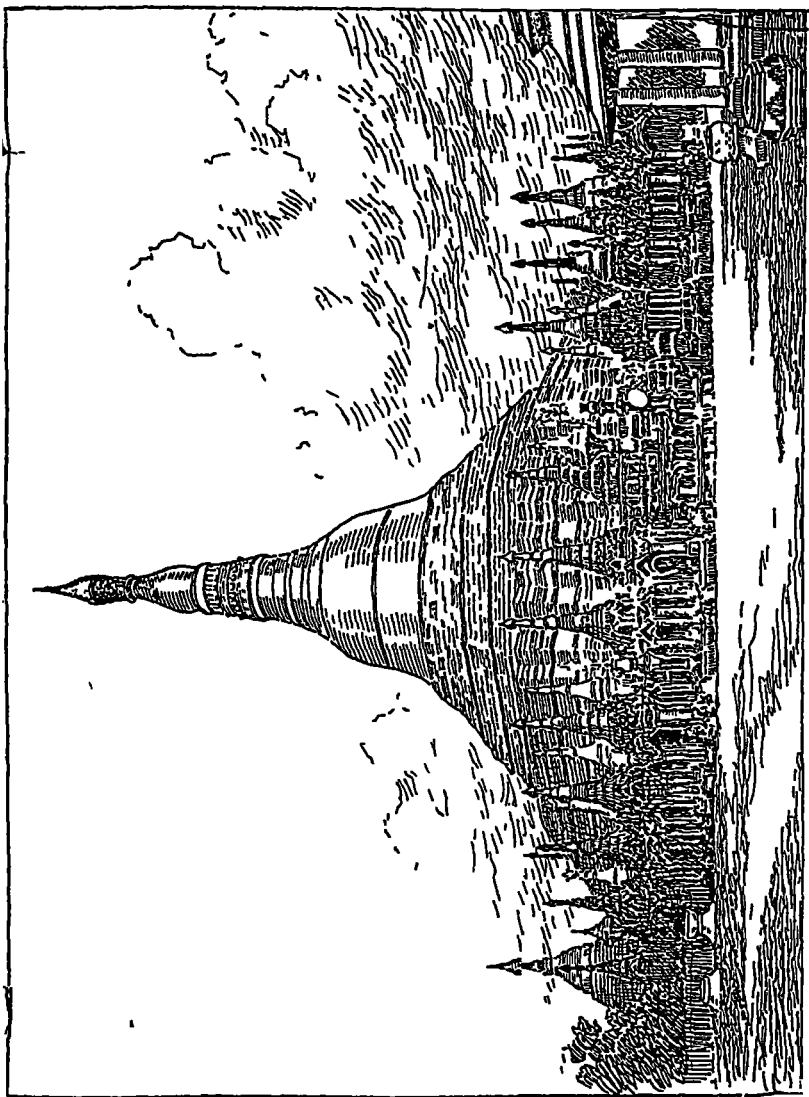


FIG 61.—SHWE DAGON PAGODA.—RANGOON

quarter of the globe are loaded with flour, wheat, frozen meat, wool, hides, coal, gold, silver, copper and tin in enormous quantities, besides a great variety of manufactured articles

**Pacific Routes** The Pacific Ocean lies between the Americas on the east and Asia and Australasia on the west. The routes across the ocean are mainly a continuation of the Atlantic and Indian Ocean routes, the trade between Asia and America, by means of the Pacific, being small. The cutting of the Panama Canal has increased the use of the ocean in a remarkable manner.

Find on Fig 77A the following ports, and notice the distances and times taken from Southampton

Port	Distance	Time
Colon - - - -	5,260 miles	18 days
Callao ( <i>via</i> Panama) - - -	6 830 "	27 "
( <i>via</i> Cape Horn) - - -	11,380 "	38 "
Valparaiso ( <i>via</i> Panama) - -	8 310 "	31 "
( <i>via</i> Cape Horn) - - -	9,900 "	35 "
San Francisco ( <i>via</i> Panama) -	8 900 ,	35 ,
( <i>via</i> Cape Horn) - - -	15,500 "	49 "
Honolulu ( <i>via</i> Panama) - - -	10,700 "	36 ,
Wellington ( <i>via</i> Cape Horn) -	13,660 "	43
( <i>via</i> Suez) - - - -	15,700 "	45 "
( <i>via</i> Panama) - - - -	12,880 "	40 "
Sydney ( <i>via</i> Suez) - - - -	13,162 "	42 "
( <i>via</i> Panama) - - - -	14,300 ,	45 "

**Routes from America to Asia and Australasia** The distance from Vancouver to Yokohama is 5300 miles, and the journey takes 18 days. Other important ports engaged in the trade across the Pacific are San Francisco and Valparaiso, and they have direct communication with Yokohama, Shanghai, Hong Kong, the Pacific Islands and Australasia. The distance from San Francisco to Auckland is about 6000 miles (Fig 62).

Prior to the cutting of the Panama Canal, vessels sailing from New York to China and Japan used the Suez Canal, but the route through



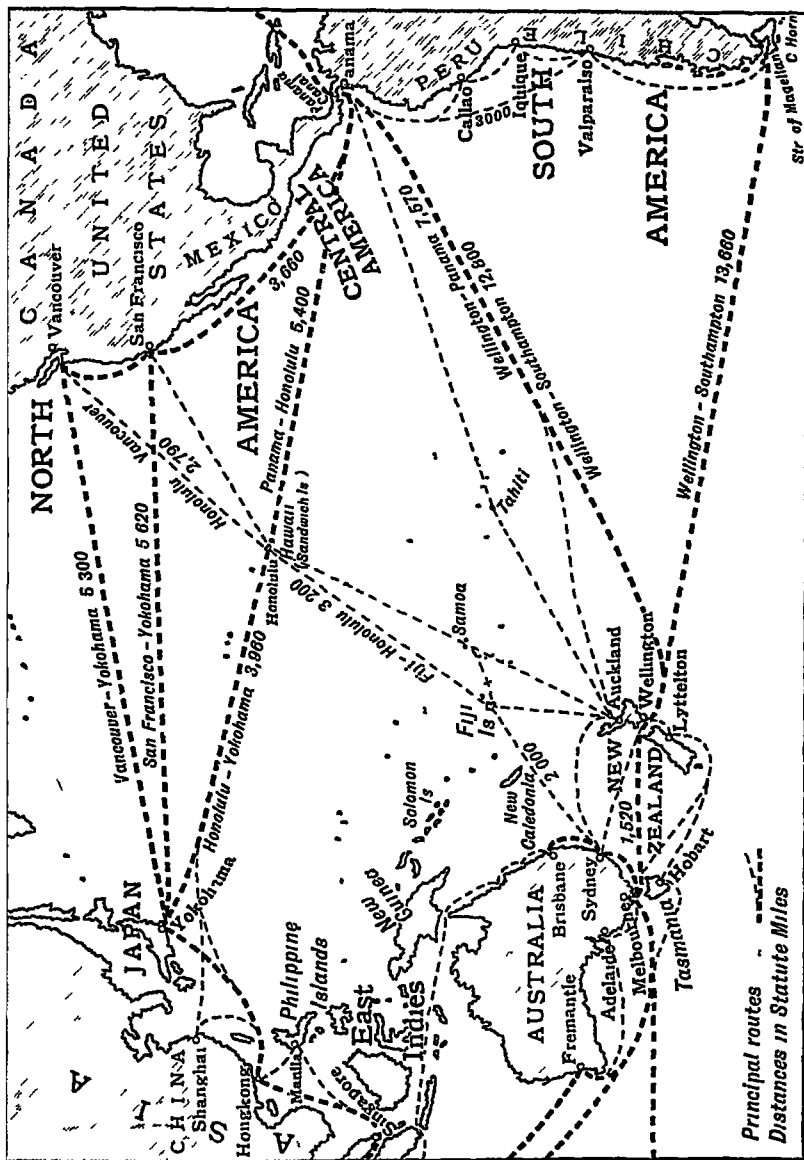


FIG 62--TRADE ROUTES OF THE PACIFIC OCEAN

the Pacific *via* Panama now gives a shorter journey The journey, *via* Suez to Yokohama, is the longer by 4000 miles Similarly, the Panama Canal shortens the route from New York to Wellington by 2500 miles, and from New York to Honolulu by 4500 miles

This shortening of the journey from the eastern ports of America to Australasia and eastern Asia has increased the commercial importance of the United States

**Western Europe and the Pacific Routes** Prior to the construction of the Panama Canal, the Pacific was often used on the return journey to Europe from Australasia Outward bound vessels had the choice of the Suez and Cape routes, the Cape Horn route being unsuitable owing to adverse winds and storms Sailing vessels always went to Australasia *via* the Cape of Good Hope, and returned round Cape Horn, thus obtaining the utmost benefit from the westerly winds Steamers generally used the Suez route on the outward journey, but could return across the Pacific

Trade with the western side of America and the Pacific Islands was forced to pass round Cape Horn The canal route is now used, and a considerable saving of time is effected

The route to New Zealand *via* Panama is 1000 miles shorter than the Suez route, and that between London and San Francisco is shortened by 6600 miles

**The Panama Canal.** Notice on Fig 63 that the canal runs from Colon on the Atlantic to Panama on the Pacific, and notice also the situation of the Gatun Locks, the Culebra Cut, and the Miraflores Lock Use the scale of miles to discover the length of the canal

The canal was begun by the French in 1852, but owing to the high death rate, caused by disease, progress was very slow In 1904 the United States took the work in hand, the first step being to wipe out malaria by draining the swamps and endeavouring to exterminate the mosquitoes

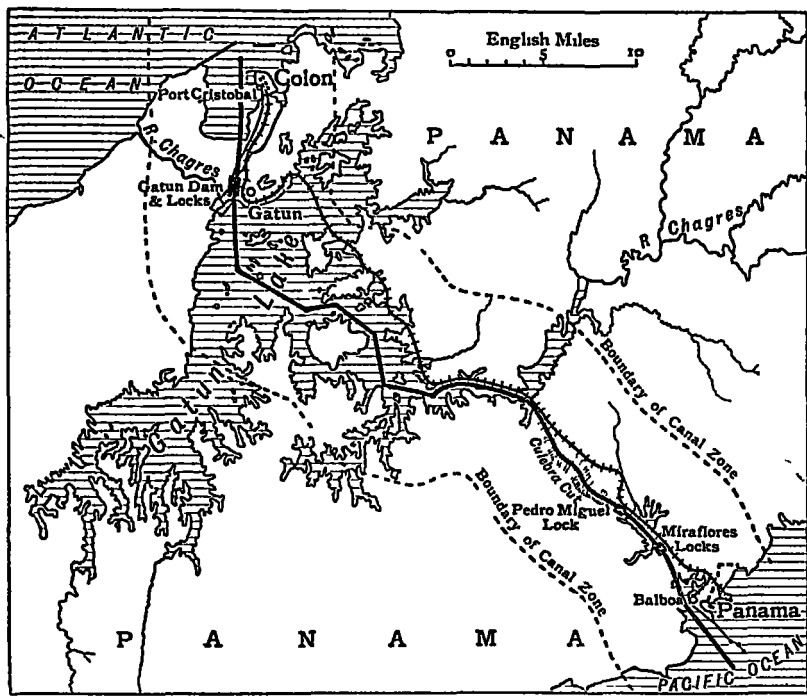
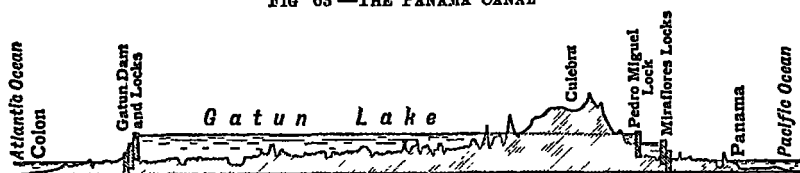


FIG 63 —THE PANAMA CANAL

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FIG 64 —SECTION ACROSS THE ISTHMUS OF PANAMA  
(The height is exaggerated 100 times)

At the Gatun locks ships are raised 85 ft to the level of the Gatun lakes, and at the Miraflores Lock they are lowered 30 ft to the level of the Pacific. The Culebra Cut was the most difficult part of the canal to make, as the sides were constantly moving.

**The Trade of the Pacific.** The western side of America is rich in a variety of products. British Columbia has salmon, timber, gold, and copper. California produces fruits, wine, and gold, and its port of San Francisco is the outlet for much of the mineral wealth of the western part of the United States. Central America, and the northern part of South America, export tropical timbers (mahogany, rosewood, etc), cocoa, coffee, rubber, and copper. Chile is the source of the world's supply of nitre or Chile saltpetre.

The islands of the Pacific have two great products—sugar and coconut products (coir and copra).

New Zealand exports wool, frozen lamb, wheat, butter, and cheese.

**Coaling Stations.** There are good supplies of coal in Vancouver Island, and in South Island, New Zealand, but many other ports are equipped as coaling stations. Pick these out on Fig 45, and notice that Honolulu is the chief station in mid-ocean. Honolulu, in the Hawaiian Islands, has an excellent situation as a collecting centre for material from the surrounding islands, and, as a coaling station on the routes from America to Asia, and from North America to Australasia. Suva, in the Fiji Islands, and Apia, on the Samoan Islands, have a similar importance.

### Notes

**Opium** is the thickened juice of the capsules of the white poppy, which is grown in Turkey, India and China. It is a powerful medicine inducing sleep, and is used to relieve pain.

**Nitre, Chile saltpetre, or Caliche** is found in deposits spread over a large area in North Chile, on the west coast of South America. The strata of caliche varies from a few inches to several feet in thickness, and occurs beneath layers of rock. The salt is soluble in water, but occurs in such great deposits owing to the intensely dry climate of this area. It is largely exported from Iquique for manuring the land and the manufacture of chemicals.

**Betel Nut.** The name betel is given to a species of palm native to the East Indies, and also to a vine similar to that which yields black pepper.

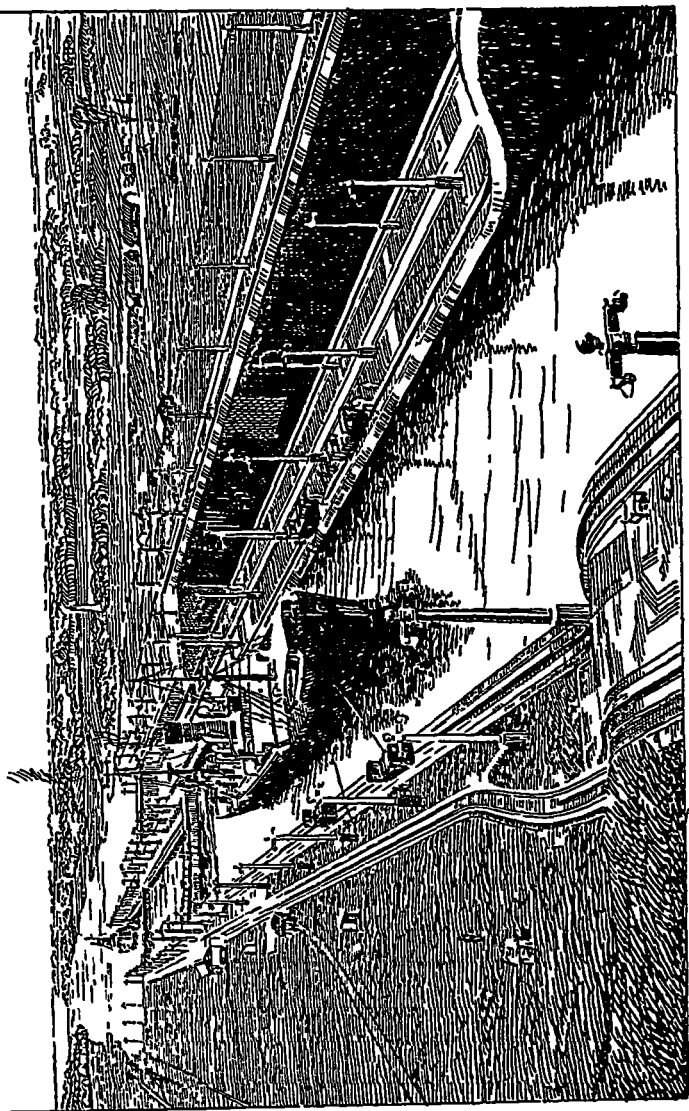


FIG 05.—THE GATUN LOCKS—PANAMA CANAL

The betel nut is the fruit of the betel palm, and this nut, when wrapped in the leaves of the betel vine, together with a little lime, is chewed by the Orientals and natives of the East Indies. Betel nut acts as a powerful stimulant to the salivary glands and digestive organs, turning the saliva a bright red colour and staining the teeth.

### Exercises

- 1 Describe a sea journey from Malta to Aden
- 2 Name the chief ports of call on the Suez route from London to Japan
- 3 Briefly describe the commercial importance of the following places  
Gibraltar, Aden, Colombo, Singapore, Hong Kong, Honolulu
- 4 What are the chief commodities brought to England from the Mediterranean ports? Give reasons
- 5 How has the construction of (a) the Suez Canal and (b) the Panama Canal assisted the trade of the British Empire?
- 6 Give the name and situation of each of the ports from which the following goods are brought to England: tin, coal, wool, frozen meat, spices, cotton, jute, wheat, butter, dates, currants, wine, silk.
- 7 Describe four routes by which it would be possible to travel from Liverpool to Vancouver
- 8 What are the leading exports of (a) California, (b) Chile, (c) the Pacific Islands?
- 9 Explain the illustrations, Figs 55, 56, 57 and 65
- 10 Explain the map of the Panama Canal, Figs 63 and 64
- 11 State the situation of the following places: Karachi, Rangoon; Fremantle, Lyttelton, Adelaide, Callao, Colon, Fiji Islands
- 12 Name three ports in each of the following zones: north temperate, torrid, south temperate
- 13 What daily scenes would you expect to see at Bombay (a) similar to those in an English town? (b) dissimilar?

## CHAPTER IX

### RAILWAYS AND COMMERCE

**Railway Construction** Transport by rail is much more expensive than transport by water. The ocean highways are provided by nature, and very little has to be expended on their upkeep. Railways

have to be constructed at considerable expense, and much labour and money must be expended in order that they may be maintained in good repair. A ship can carry a much greater load than a train, but the train has the advantage of greater speed than the boat.

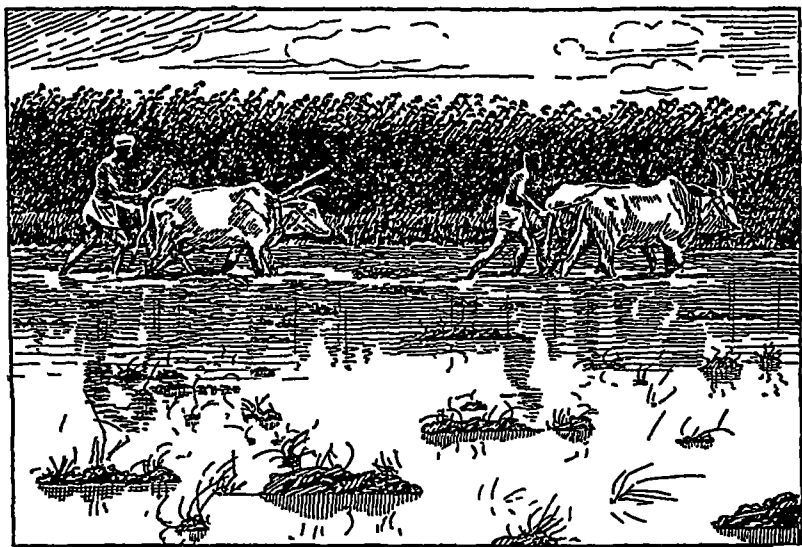


FIG 66 —PLOWING A RICE FIELD WITH OXEN  
By what routes is rice brought to your home?

A little more than one hundred years ago the stage-coach, wagon, canal-boat, and sailing-ship were the chief means of transportation. When cities reached a certain size they could grow no larger, for it was not possible then to carry the necessities of life to them in sufficient quantities. But to-day every village in such a country as England is able to obtain supplies of food and clothing from any part of the world. Thus we get wheat from Canada, fruit from Australia, rice from India, meat from South America, cotton from the United States, wool from Australia, etc., etc. This great change is mainly

due to the construction of railways The following figures convey some idea of the marvellous progress in means of communication by rail There are in the United States 260,438 miles of railway, Canada, 42,437 miles, South America, 60,480 miles, Europe, 235,800 miles, Asia, 91,300 miles, Africa, 44,580 miles, Australia, 27,800 miles

**Railways and Settlement** Before any area of the world can be developed it must be equipped with routes These are not always

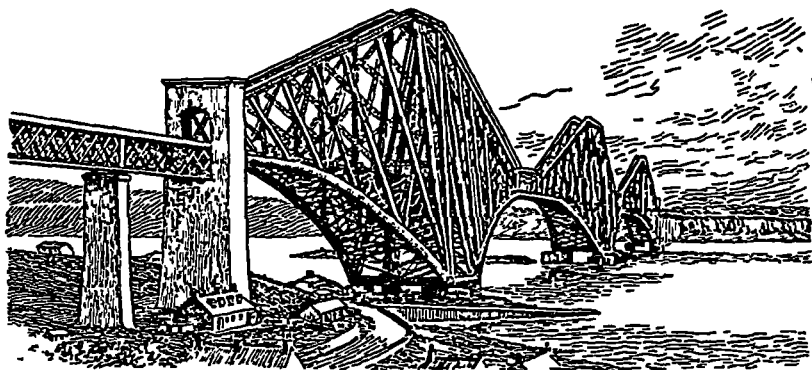


FIG 67 —THE FORTH BRIDGE  
A notable example of railway construction

supplied by nature, and must therefore be made by man The first route is often merely a trail or rough road, but sooner or later the iron road or railway must be supplied In lands like Australia, Western Canada, and Argentina, where natural routes are poor, it is the railway which opens up new regions to settlement Development follows the railway, and the area along the line undergoes a transformation In newly-developed lands, such as Canada and Australia, it is remarkable how near to the railways the bulk of the people live

The railways are usually links from inland towns to the coast, and thus serve the ocean routes Ports must be railway centres



This is necessary in order that material for shipment may be collected from a wide area, and in order that goods brought to the ports may be easily transported to their final destinations. Ports without a good railway link are therefore badly equipped for trade, and it is usually found that railway lines run to the wharves where ships rest in port. It should be noticed that neither the railway route nor the shipping route can stand alone, each being part of a great system covering land and water.

It would take too long to consider the systems of railways in the many countries of the world, but it will be of interest to study for a few minutes the maps, Figs 68, 70 and 71, showing the main railways in the Empire countries of Australia, South Africa, and Canada.

In **Australia** the main lines of railway follow the contour of the east and south coasts joining the state capitals of Brisbane, Sydney, Melbourne, Adelaide, and Perth. More than one-third of the people, mostly British, live in these capital cities. A few of the many branches of the main lines to mining and agricultural towns in the interior are shown on the map. Notice the line to the noted *silver-lead-zinc* mines of Broken Hill (N S W). The transcontinental line (1057 miles) from the gold-mining town of Kalgoorlie to Port Augusta at the head of Spencer's Gulf, was completed by the Commonwealth in 1917. The journey from Perth to Brisbane is 3480 miles. There is no railway from south to north, but Adelaide is joined by telegraph to Darwin, which is connected by cable to Batavia, Singapore, and Madras. On the opposite page is a population map of Australia. From it you will see at a glance that most of the people live near the coasts and railways of the east and south-east, the greater part of the continent is yet unpopulated.

**South Africa** There is now a network of railways in the eastern half of Cape Province and of British South Africa generally (Fig 70). The chief towns on the southern section of the Cape to Cairo Railway

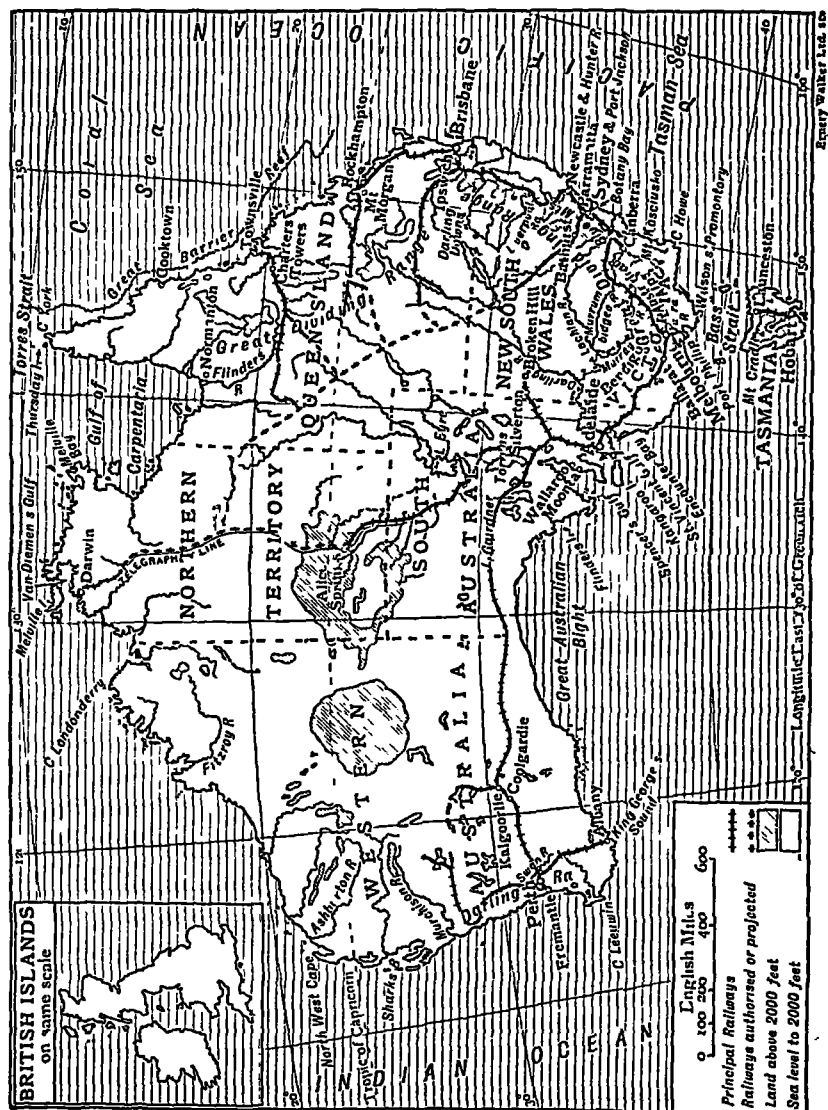
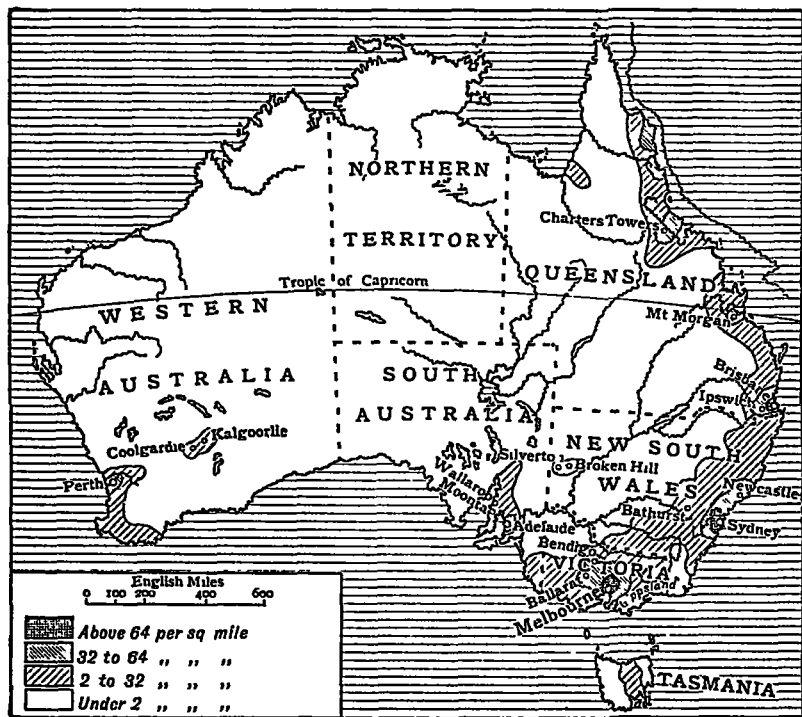


FIG 08 — GENERAL MAP OF AUSTRALIA  
(Notice the size of the British Islands)

which, in the south, is laid near the western borders of the Orange Free State and the Transvaal, are Cape Town the capital, De Aar, Kimberley the centre of the diamond industry, Mafeking, Bulawayo, Wankie with its noted coalfields, Livingstone near the famous



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FIG 69—POPULATION MAP OF AUSTRALIA WITH MINING TOWNS AND PORTS  
Compare this map with Fig 68 and note the density of population near the railways

*Victoria Falls*, Broken Hill, and Bukama near the Katanga copper mines in the Belgian Congo. Another great trunk line traverses the middle of Cape Province, Orange Free State, and Transvaal through Graaff Reinet, a rich sheep-grazing and fruit-growing centre, through Bloemfontein, Johannesburg, the centre of the gold-mining industry,

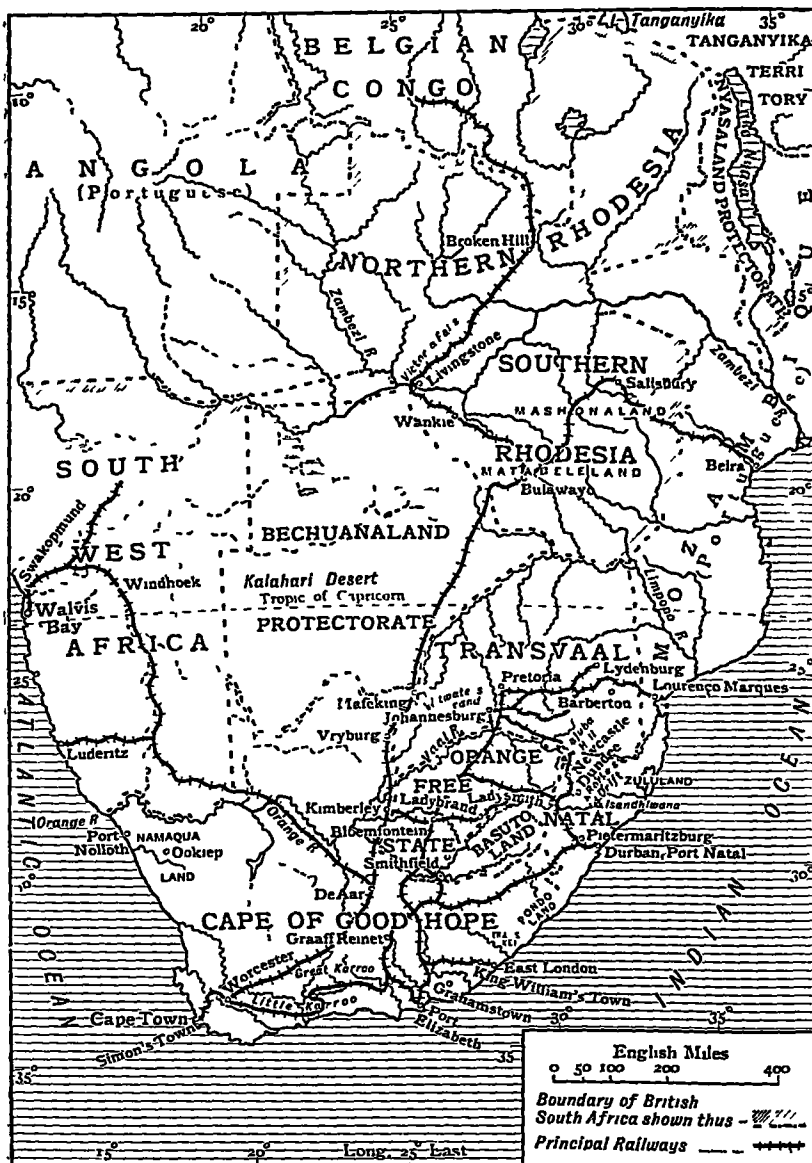


FIG 70—MAP OF SOUTH AFRICA SHOWING RAILWAYS AND TOWNS

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to Pretoria, the capital of the Transvaal. Branch lines join the trunk line with the ports of Port Elizabeth, East London, and Durban, and with Lourenço Marques and Beira in Mozambique—Portuguese territory. Thus all the important cities of the interior of South Africa are linked by rail to each other and to the ports on the coast.

**Canada** Most of the people of Canada live within a comparatively narrow strip of land stretching across the continent near the southern frontier, and since 1886, when the Canadian Pacific Railway was completed, there has been uninterrupted communication from ocean to ocean. Note on the map, Fig 71, the cities on this railway—St John on the Bay of Fundy, Montreal, a great river port, Ottawa, a noted lumber town, Port Arthur, a great lake port, Winnipeg, the centre of the grain trade, Regina, Calgary, and, on the west side of the Rockies, Vancouver, the chief city and port of British Columbia.

There are two other transcontinental railways now belonging to the system of the Canadian National Railways.

Of the other Canadian railways there is one of special importance. It is the railway which joins Montreal with the south-west peninsula between Lakes Huron and Erie, there communicating with the shortest direct line in the United States to Chicago, the great lake port and meat-packing centre at the head of Lake Michigan. A powerful, fast daily train runs between Montreal and Chicago.

There is a new important railway from the grain-growing provinces to Port Nelson on Hudson Bay, but for the greater part of the year Hudson Strait is obstructed by ice, so that the port can be used only for two or three months each year.

**Other Transcontinental Lines** All the continents are now crossed by continuous railway routes. Study Fig 77A and trace the chief lines. The chief ports on the west of Europe are linked with the great ports on the east of Asia by the Trans-Siberian Railway.

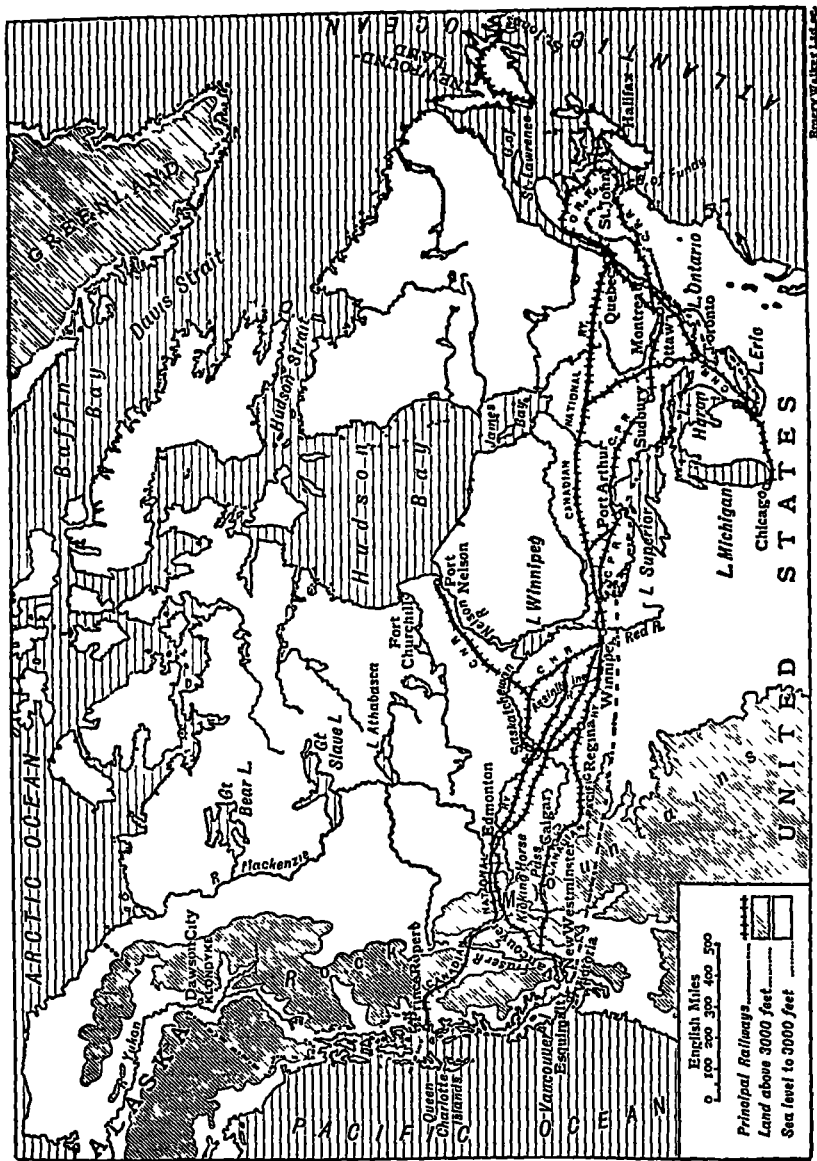


FIG 71—GENERAL MAP OF THE DOMINION OF CANADA.

**North America** is crossed by many lines linking the Atlantic and Pacific ocean ports. **South America** has the Trans-Andean Railway joining the estuary of the La Plata with Valparaiso, which is another link between the Atlantic and the Pacific. **Australia**, as we have seen, has one continuous railway joining Perth, Adelaide,

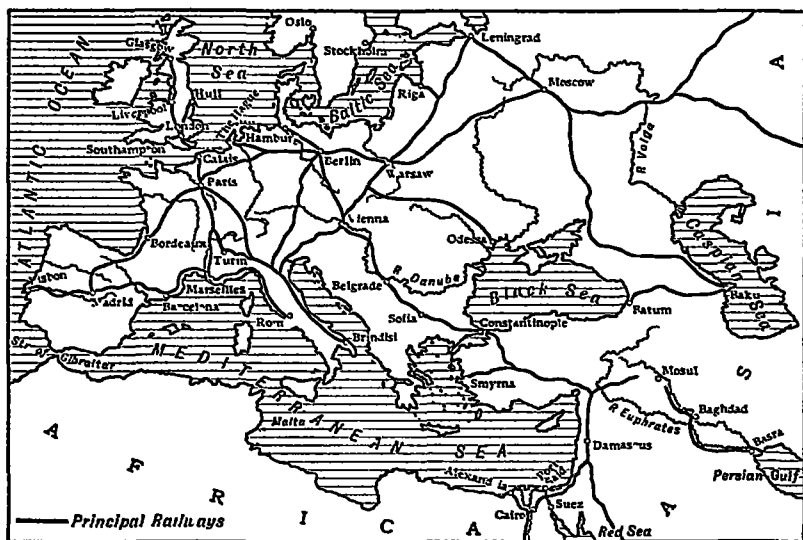


FIG 72—THE GREAT TRUNK RAILWAYS OF EUROPE

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Melbourne, Sydney, and Brisbane, and **Africa** has the Cape to Cairo route, which will probably some day join Cape Town with Cairo.

These great routes have their value increased by the construction of branch lines at many points, and thus they tend to promote development along the whole region through which each line passes.

The railways linking the English channel with the Mediterranean Sea are important. Notice on Fig 72 the lines which pass to Marseilles, Brindisi, and Constantinople. These are known as over-

land routes to the East, and are useful for mails and passengers. On a journey to India, for instance, there is a saving of about a week by using the overland route to Brindisi, joining the mail-boat there instead of embarking at a British port.

It is an interesting exercise to work out, from Fig 77A, the number of possible ways of travelling round the world by combining railway and steamship travel. The following should be traced on the map.

1 London, Moscow, Irkutsk, Vladivostok, Yokohama, Vancouver, Montreal, London (20,000 miles)

2 London, Brindisi, Suez, Colombo, Singapore, Yokohama, San Francisco, New York, London (24,500 miles)

3 London, Suez, Colombo, Sydney, Auckland, Honolulu, Vancouver, Halifax, London (29,000 miles)

4 London, Cape Town, Hobart, Wellington, Cape Horn, Rio de Janeiro, London (30,000 miles)

5 London, Panama, Honolulu, Singapore, Suez, London (27,500 miles)

### Notes

**Overland Route** is the name usually given to the railway route through France, Switzerland, and Italy, often used for passengers and mails. The journey takes about a week less than that through the Bay of Biscay and the Strait of Gibraltar.

**Transcontinental Lines** cross a land from shore to shore. The chief are (a) The Trans Siberian from Western Europe to Eastern Asia, (b) The Grand Trunk Pacific, Canadian Pacific, Union Pacific, from Atlantic to Pacific in N America, (c) The Trans Andean from Atlantic to Pacific in S America. The journey from London to Peking, using the Trans Siberian Railway, takes about 14 days, and from Montreal to Vancouver, by the Canadian Pacific Railway, about 7 days.

### Exercises

1 In what countries has railway construction considerably aided settlement? Give reasons in each case.



2 Draw a map of the chief railways of Australia and explain their importance

3 Give examples of three transcontinental railways and name some towns on the routes of each

4 Why are ports the termini of many railways? Give examples from Europe

5 What do you understand by the overland routes of Europe? Name the chief towns passed on a journey from Paris to Constantinople

6 Explain the importance of the situation of each of the following places: Winnipeg, Montreal, Chicago, Aden, Cape Town, Lourenço Marques, Sydney

7 Where and for what noted are the following places: Kimberley, Broken Hill (Australia), Kalgoorlie, Graaff Reinet, Port Arthur (Canada), Port Nelson, Johannesburg?

8 How often must passengers change when travelling by the short route from London to Sydney?

9 Compare the advantages and disadvantages of the transport of goods by canal, rail, and air

10 Explain the map, Fig 72

11 Explain the illustration, Fig 66

## CHAPTER X

### ESSENTIAL FOODS—MEAT

**Cattle** Meat forms an important part of the diet of a large section of the human race. Beef, mutton, and pork are the three chief varieties.

In Fig 73 are shown the chief grasslands of the world where cattle are reared. These grasslands are called *prairies* in N America, *llanos*, *campos*, and *pampas* in S America, *veld* in S Africa, and sometimes *downs* in Australia.

Cattle are found in all lands except those which are forested, rugged, or very dry, but they are found in the largest numbers in regions possessing rich moist grass.

Cattle are used as draught animals as well as for beef and milk.

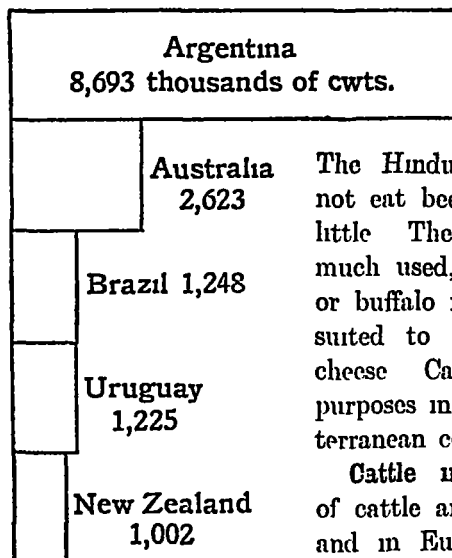


production The following table shows the approximate number of cattle, in millions, in ten countries of the world

COUNTRY	CATTLE	COUNTRY	CATTLE
India -	206 millions	Germany	20 millions
U S A - -	66 ,	China - -	22 ,
Brazil	40 ,	Australia	14 ,
Russia - -	50	France - -	15 ,
Argentina -	32 ,	United Kingdom -	8 ,

These figures should be compared with Fig 74, which indicates the beef-exporting areas of the world It is obvious that certain

differences need explanation In India, cattle are the chief draught animals, beef is not a national food, and it is not exported



The Hindus, for religious reasons, do not eat beef, and the Moslems eat but little The milk of Indian cattle is not much used, for the Hindu prefers goat or buffalo milk, and the climate is unsuited to the making of butter and cheese Cattle are also used for draught purposes in China, Japan, and the Mediterranean countries

**Cattle in Europe.** Great numbers of cattle are reared in the British Isles and in Europe, but there are no extensive grasslands such as those shown on the map The British Isles have

produced the largest number of famous breeds The cattle are pastured in summer, and stall-fed on oil-cake, etc., in

FIG 74—WORLD EXPORTS OF BEEF

winter for fattening Dairy cattle are generally pastured all the year round Ireland rears many dairy cows and large numbers of young cattle for export to England, where they are fattened for slaughter

France rears both beef and dairy cattle on the moist grasslands of the north and west, Holland, Denmark, Sweden, Finland, and Switzerland are essentially dairy countries Central Europe and Italy rear about equal numbers of beef and dairy cattle Spain

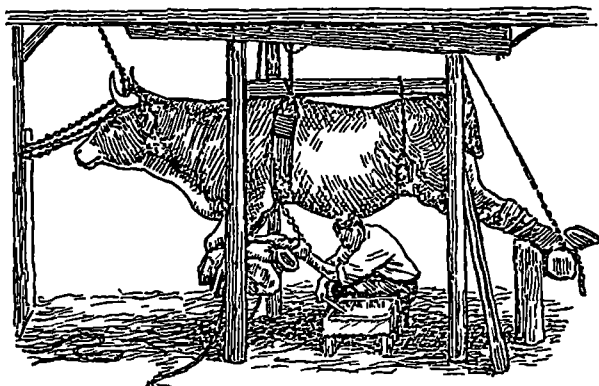


FIG 75—SHOEING AN OX—FRANCE

and Portugal are beef producers Except in southern Italy cattle are not generally reared in the Mediterranean countries owing to the summer drought

Sheep are reared mainly for wool and mutton Mutton is one of the world's chief meats The following table shows the approximate number in millions of sheep in nine countries of the world

COUNTRY	SHEEP	COUNTRY	SHEEP
Australia	112 millions	New Zealand	31 millions
Russia -	66 "	United Kingdom	28 "
Argentina -	44 "	India -	25 "
U S A	53 "	Spain - -	17 "
S Africa - -	46 "		

Sheep thrive best in damp, cool climates with good pasture. The invention of refrigerative methods has made it possible for the cities of Europe to import mutton from Argentina, Australia, and New Zealand, where cheap land and good climates have made sheep-farming one of the chief occupations. In Europe, Great Britain, Holland, Germany, and N France rear sheep both for mutton and wool, Spain, S France, Italy, the Balkans, and S Russia rear sheep chiefly for wool.

Pigs thrive well in almost any climate, and as they eat almost any kind of edible refuse they can be kept on household or dairy waste, or surplus farm produce. Pigs are often kept in sties and farm-yards, so that they are frequently found in thickly populated districts. Pork is rendered more digestible by being salted, hence the importance of bacon and hams. Bacon, which is prepared by salting and smoking the sides or *fitches* of the carcass, is the chief product in commerce. Denmark, Ireland, and U S A are the chief exporters of bacon. Hams, which are prepared in a similar way, are better flavoured and dearer than fitches. They are exported chiefly from Ireland, Denmark, Westphalia in Germany, and U S A.

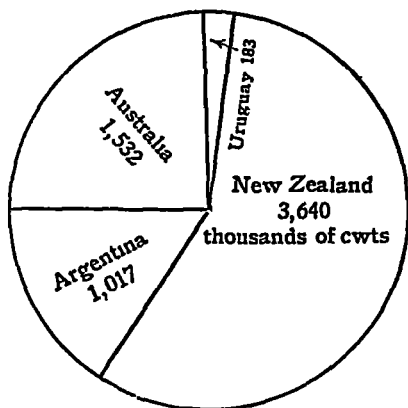


FIG 76—WORLD EXPORTS OF MUTTON IN THOUSANDS OF CWT

Pig-breeding is of great importance in Denmark, Holland, Belgium and the forests of Central Europe, where the animals are fed on acorns. Spain and Portugal use the beech forests for rearing pigs, pigs and potatoes are the main products of Ireland, England rears a considerable number and is famous for its breeds. Pigs

are numerous in India, China has more pigs than any other country in the world

**The Prairies of America** Look again at the map of the Western States of U S A, Fig 44 The contours show that the **Upland Plains** rise gradually from 1500 ft to a height of nearly 5000 ft towards the Rocky Mountains The surface of these treeless, grassy plains is broken by numerous tributaries of the Mississippi that have cut deep valleys The rainfall is slight, and agriculture can, as a rule, be carried on only in the valleys that are irrigated On these plains the air is dry and invigorating, there are unlimited "runs" for the cattle, and abundance of grass growing in wiry tufts The best cattle are reared on the lower levels, as sheep can graze on the higher lands Immense numbers of cattle, horses, sheep, and pigs are reared, especially on the high plains of Texas, Kansas, and Nebraska It will be noted that the hundredth meridian almost passes through the middle of each of these slope states of the mountains, east of the meridian the rainfall is greater, and, as we shall learn later, immense crops of wheat, oats, barley, maize, and (in Texas) cotton, are grown

The cattle of the Upland Plains are not dairy cows that require regular milking, but they are semi-wild animals, looked after in great ranches by cowboys In due course many of the cattle are sent to the fertile and better watered lands farther east, to be fattened on maize and oilcake made from cotton seed, after which they are dispatched to the great stockyards and meat-packing factories of Chicago, Kansas, St Louis, Omaha, etc, where every part of the animal is used The meat is either sold for food, canned, or used for making meat extract, glue is made from the hoofs, buttons, studs, handles, etc, from the bones, hides and skins are tanned for strong leather, the fat, if not used for suet, provides tallow, stearine, glycerine, and various acids for soaps and candles, and oleo for margarine, the hair is used for a variety of purposes, the intestines



FIG 77 — THE UNITED STATES — EASTERN STATES

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to make gold-beater's skin, the gall provides pepsin, thyroid, and several other medicinal extracts. Hardly a particle of the animal is wasted.

U S A grows vast quantities of maize or Indian corn, which is largely used for fattening cattle and for feeding hogs and poultry. "Pork and beans" is a favourite food of industrious western men, hence vast numbers of swine are annually canned, and in addition much bacon is cured. It is said that in the pork-packing centres, nothing of the pig is wasted except its "squeal"! It is difficult to realise what enormous numbers of cattle and swine are annually killed either for food at home or for export, but in the year 1937 it was estimated that there were 66 million cattle and 42 million swine in U S A. Most of the cattle on the ranches are fattened and killed, but in certain states butter, cheese, and condensed milk are produced to the extent of many millions of lbs weight annually, for the 122 millions of people require huge quantities of such necessary food.

The most important city on the Great Plains is Denver in Colorado State, about 12 miles from the Rocky Mountains. Denver is the centre for the distribution of live stock from the high plains, it is also the emporium for the gold, silver and coal that is mined in California. The town has many handsome public buildings and is an important railway centre.

Many sheep are reared on the ranges. On a good-sized ranch there are 30,000 to 40,000 head. One man with a dog can herd 2500 when they are grazing. He selects a spot near water for a camp, and drives his sheep out each morning two or three miles, and back at night. When the grass is eaten in one vicinity the camp is moved. The life of the herder is very lonely, once a week a man brings him food, otherwise the herder has no companions except his sheep and his dog, and perhaps a horse. Wyoming State holds first rank in the sheep industry. The sheep are pastured



on the mountains during the summer and are driven to the plains for the winter, but a large number die off during this season

**Canada** To the west of the wheatlands, where rainfall decreases under the lee of the Rockies, cattle rearing to some extent takes the place of agriculture. West of Regina the dry belt begins, and instead of wheat fields, grass-covered plains with scattered homesteads are seen. The "bunch grass," which turns into hay without being cut, grows to a height of from two to three feet, and great numbers of cattle are pastured on it. Alberta was the greatest ranching country in America from 1880 to 1900, but the farmer is steadily driving out the rancher, and the days of the big herd are past. Alberta is now second in the production of wheat.

The establishment of pork-packing houses at Edmonton and Calgary has greatly encouraged the hog industry. Canned pork, bacon and hams form a leading export of Canada. The seaboard states of Nova Scotia, New Brunswick, and Prince Edward Island, with that part of Ontario near the Lakes, have good grasslands. In these districts dairy-farming is an industry of considerable importance. Milk from the dairy farms is taken to factories, where butter and cheese are made in a scientific way. Ontario produces about one-half of the milk, cheese, butter, and casein of Canada.

The following values of some of the leading exports of Canada in one year give a good idea of the big industries of the Dominion.

Millions of dollars *Wheat*, 223, *Wood and Wood Pulp*, 81, *Paper*, 110, *Iron and Manufactures*, 69, *Nickel*, 45, *Wheat Flour*, 21, *Vehicles*, 19, *Cheese*, 11, *Meats*, 36, *Furs*, 18, *Barley*, 14.

**Llanos and Campos** To the west and north of the Orinoco, the chief river of Venezuela, in the north of S. America, are extensive plains called Llanos. Near the river the low-lying land is swampy and unhealthy, for it is annually flooded during the rainy season. But the Llanos rise with gentle slopes to the higher lands, and these

upper plains being well drained are covered with rich grass, which provides pasturage for horses and cattle. The people of these plains are called *Llaneros*, and their chief occupation is cattle breeding. They are *nomads*, that is, they wander with their cattle over wide, scattered areas, for in the dry season the land is parched.

Hides and cattle are important exports of Venezuela.

In the east of Brazil are the Brazilian Highlands, with many deep valleys separated by steep ridges called *serras*—which is the Portuguese for the Spanish word *sierras*. West of the *serras* the highlands are called *Campos*. They are covered with grass, which affords pasturage for great numbers of cattle. Many rivers flow through the *Campos*, and clumps of trees dotted here and there give the appearance of Savannas. Live-stock rearing and meat-packing industries are of great importance in Brazil, and leather, hides, and frozen and chilled meat

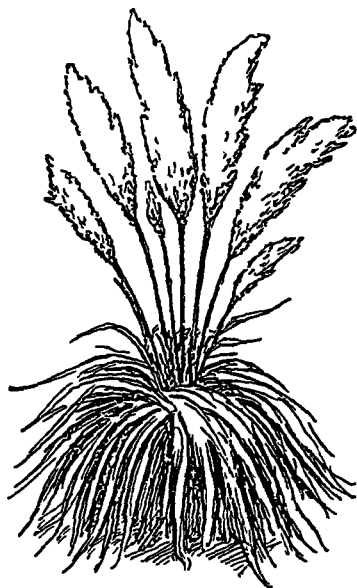


FIG 78 —PAMPAS GRASS

are annually exported to the value of several million £s.

The **Pampas** is the name given to the treeless, grassy plains of Argentina. The beautiful pampas grass, with its feathery spikes eight feet high, covers great tracts of the land. This grass is so full of seeds that special machinery has to be used for cleaning the wool of sheep reared in Argentina. For the cattle *alfalfa* is grown. It is a European plant of the lucerne type, which, on account of its long roots, thrives in the drier plains.

Before the coming of the European, the only inhabitants of these immense plains were tribes of wandering Indians, who hunted small deer. With the coming of the Spaniards, horses, cattle, and sheep were introduced. The Pampas being in the temperate zone, these animals quickly multiplied. The Indian became a horseman and rancher, and in time a mixed race of Indian and Spanish descent called *Gauchos*, ruled the Pampas. (The word *Gauchos* is pronounced like *Gow'-chôse*.)

The *estancias* of those days were very large, the cattle wandered over a huge expanse of prairie and were rounded up from time to time by *Gauchos* for slaughter. Millions of cattle were killed for the sake of their hides and horns alone, thousands of tons of meat being left to rot in the open. The *Gaucha* still retains his *bombachos*—the broad flowing trousers—his light, delicate boots, his *poncho*—a blanket garment—his *sombrero*, and his broad heavy knife in its long silver sheath, but with modern methods of stock-raising there is little scope for his wonderful horsemanship and the use of bolas and lasso. The *Gaucha* is fast dying out.

It was the refrigerating method, enabling fresh beef to be shipped abroad, that started Argentina upon the road to riches. Now the *estancia* has become more of a farm and less of a ranch. The cattle are enclosed in paddocks, instead of letting them feed on tufts of pampas grass, the farmer plants alfalfa for his herds and flocks, and has thus greatly added to their number and quality. The chilled meat industry has in recent years developed to extraordinary dimensions, and immense *frigorificos* in the neighbourhood of the Plate River provide employment for thousands of workers. More beef, frozen and chilled, is supplied to Europe by the Argentine than by any other country.

The Argentine landowner of importance counts the extent of his holding by the league, numbers his live-stock by the thousand, and employs several hundreds of stock-riders, shepherds, and labourers

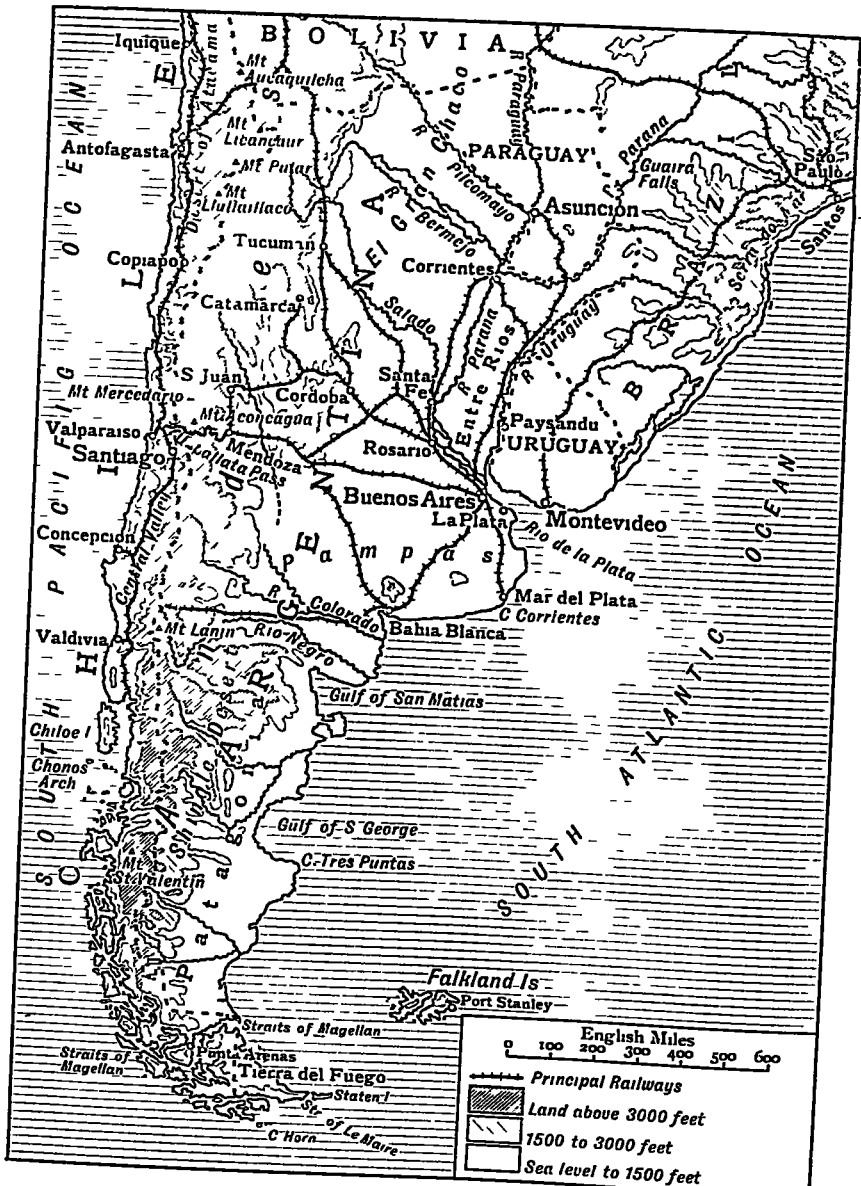


FIG 79—SOUTH AMERICA—THE ARGENTINE REPUBLIC

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to tend the animals and pastures. Thus a large estancia of some fifteen square leagues may carry its 25,000 cattle, its 20,000 sheep, and many thousands of horses. On the Lemco farms, which extend into Uruguay, 325,000 cattle are supported by the estate.

A valuable export of Uruguay is **jerked beef**, which is beef cut into long strips and dried in the sun, it is hard and tasteless, but being convenient to carry and keep, it is largely eaten in Brazil and other parts of S America. A familiar sight in Uruguay is a huge stack of salted, dried strips of beef covered with a tarpaulin like a hay-stack, ready for transport. Other noted products of the *estancias*, or stock farms, are tinned ox tongue, meat extracts, hides, and tallow. The firm of Liebig has large meat extract works in Uruguay.

South of Buenos Aires, flocks of sheep amounting to many millions are grazed, especially in **Patagonia**, the greater part of which belongs to the Argentine Republic. Not many years ago the plains of Patagonia were occupied by a small number of roving Indians, who are reckoned the race of largest men on earth. But a company was formed for sheep rearing, and thus proving most successful, sheep rearing has become the first industry of Patagonia.

**Towns.** From the map, Fig 79, it will be seen that railways extend from **Buenos Aires**, the capital, in all directions. Buenos Aires (the place of *good air*) is the largest city in S America, having a population of over 2,200,000. Owing to the silt in the Plate estuary it has been necessary to build an artificial harbour at a great cost.

Buenos Aires has little to distinguish it in any way from a continental city like Paris. There are boulevards and palatial public buildings, plazas and parks, theatres, restaurants, cafés and tea-rooms, motor-cars, tramways, "tubes," and a general whirl of traffic through the streets. The commercial prosperity of Buenos Aires is seen in the extensive docks, its banks and mercantile offices, its meat-chilling establishments, its grain storehouses

and elevators, its pedigree stockyards and huge central produce market

**Rosario** and **Santa Fe** are river ports which deal in grain, wool, and cattle. **Cordoba** is a centre of a great stock-rearing area. **Bahia Blanca** has in recent years become one of the chief ports of the Argentine. **Montevideo**, splendidly situated on the Plate estuary, is the capital and chief port of Uruguay. **Asuncion**, well placed at the junction of the Paraguay and Pilcomayo river, is the capital city of Paraguay.

**South Africa** Wool is one of the most important articles produced in S Africa for export. The sheep are mostly reared on the **Karoo**, but flocks are also increasing in other parts of the Union. It is calculated that there are 48 million woolled sheep in the Union (Australia has 110 million sheep). Karroo pasture consists of grass, and what is known as *Karoo bush*. The aromatic little grey-green shrub, which stands some eight or ten inches high, and has roots penetrating several feet below the surface, provides food for millions of sheep long after it has been burned up by the sun into little more than a dry bunch of twigs. This *bush* is more valuable than grass for feeding sheep, not only for its richer feeding qualities, but for its greater hardiness. When the early frosts have killed all the grass, the Karroo bush still flourishes. Under severe frosts it wilts, but it is then at its best as food for live-stock, for it becomes a naturally cured and high-class fodder. The production of wool for a year amounted to 207 million lbs. (Australian production for the same year amounted to 971 million lbs.)

The highest part of the plateau of S Africa is the **High Veld** of the Transvaal, which is 6000 ft above sea level. The veld, which is a Dutch word for *field*, is the name given to the extensive, open, temperate grasslands of the plateau. The lower and moister parts of the plateau are known as the **Middle Veld** and the **Low Veld**. Ranching in S Africa is mainly carried on in the remoter districts

where land is cheap, especially on the High and Middle Veld. The Low Veld is unsuitable for cattle rearing on account of the tsetse fly. The rancher depends entirely on the natural grazing, and he ranches in the warmer parts of the country where no shelter beyond what the bushes and high grass afford is needed for the animals even in winter. Much progress has been made in recent years in the controlling of cattle diseases, so that the value of the live-stock has greatly increased. It is estimated that there are some 10 million cattle in the Union (Australian cattle number 14 million). Butter and cheese are made in sufficient quantities to supply the home needs and to allow a certain amount for export.

**Australasia** Queensland and New South Wales rear beef cattle in great numbers, but in the cooler and moister coastal regions of New South Wales and Victoria, and in the Murray-Darling Basin, dairy cattle are reared to supply the cities with milk, butter and cheese. Chilled beef, butter and cheese are largely exported.

The greatest of all the Australian products is wool. The pasture is less dependent on rain than other growth, and immense numbers of sheep are reared in all the states, the largest numbers are reared on the hills among the head waters of the Murray-Darling system. Mutton and lamb, preserved by the cold process, are exported mainly to the United Kingdom, the value of the wool exports for a season is over £62,000,000.

New Zealand is one of the world's best examples of a temperate, maritime climate. The prevailing westerlies bring much rain to the mountainous Westland of South Island, on the east the Canterbury Plains and Otago are the driest districts in New Zealand. Throughout the North Island there is a plentiful rainfall, with more on the west than on the east. In the Canterbury Plains and other parts European grass has been largely sown for cattle and sheep. Sheep are mostly reared in the eastern districts of Canterbury and Otago.





in South Island, Wellington and Hawke's Bay districts in North Island. Four-fifths of the cattle are reared in the coastal districts of North Island, and in the south-west round Mount Egmont.

Hamilton is the headquarters of the New Zealand Co-operative Dairy Co., one of the largest organisations of its kind in the world. The principal exports of New Zealand are wool, frozen meat, butter, cheese, tallow, skins, and hides. New Zealand has the largest exports of dairy produce in the world. Auckland is the chief port and largest city of the Dominion. Wellington is the capital and is a port of call. Christchurch, the largest city in South Island, is eight miles from Lyttelton, the "mutton port." Dunedin is the outlet for the Otago produce, and is the chief city of the south.

## Notes

**Draught animals**—beasts of burden, or the animals used for carrying or drawing loads—horse, ox, dog, elephant.

**Concentrated meats**, meat foods reduced to small bulk and containing the chief nourishing extracts, such as Bovril, Oxo, Liebig's extract of meat.

**Ranch**, a stock farm on which cattle are reared in large numbers—principally found in the United States and Argentina.

**Tsetse fly**, a two-winged brown and yellow fly, is a native of tropical Africa, its bite is poisonous to buffaloes, oxen, and horses. There are about fifteen known species of these flies, varying in length from a quarter to a half inch. With their wings closed they have much the appearance of a common house fly. The flies effect cover in water-reeds, bushes, or forests. The early explorers found the "fly belts" (regions infested by these flies) impassable, for their oxen and horses were stricken down by fly sickness. One species, by transmitting germs from animals to men, causes sleeping sickness.

**Hides**, the undressed skins of the larger animals, the ox, horse, elephant, etc.

**Skins**, name applied to the skins of calves, sheep, deer, goats and lambs. Lighter kinds of leather are made from skins than from hides.

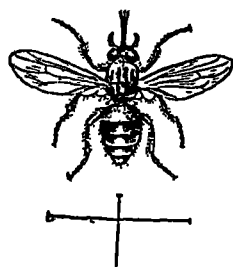


FIG 81—TSETSE FLY

**Exercises.**

- 1 Explain the map, Fig 73
- 2 Write in list form the countries that export large quantities of the following beef, mutton, bacon
- 3 What conditions have enabled Argentina to become a great exporter of meat ?
- 4 What conditions have enabled Australia to become a great exporter of wool ?
- 5 Give the names and situations of the ports exporting wool, Canterbury lamb, beef, bacon, butter and cheese respectively
- 6 Compare cattle rearing in England with that in U S A
- 7 State the situation and importance of Asuncion, Bahia Blanca, Rio de Janeiro, St Louis, Denver, Amsterdam, Rotterdam
- 8 Name the routes by which the following commodities can be sent to the United Kingdom Canadian bacon, U S A canned pork, Argentine beef, New Zealand butter, Australian wool
- 9 Explain the map, Fig 79
- 10 Compare the distances covered in conveying meat to London from (a) Australia, (b) Argentina, (c) New Zealand (Use Fig 77A)
- 11 Why are the chief cities of Australia near the coast ? In what other parts of the world are the chief cities similarly situated ?
- 12 By what routes could you travel from Southampton to Wellington ? Which would be the shortest journey ?
- 13 What do you understand by a *well situated town* ? Give examples from the British Dominions

**CHAPTER XI****CEREALS IN THE TEMPERATE ZONES**

**Wheat.** Bread made from wheaten flour is one of the staple foods of the white race. Fig 82 shows the chief wheatlands of the world, and it should be noticed that most of these are in the temperate zones. The areas of heavy production are shown in black. They are the middle states of N America, the Argentine of S America, Romania and the Ukraine of Europe, the Punjab of India, and the

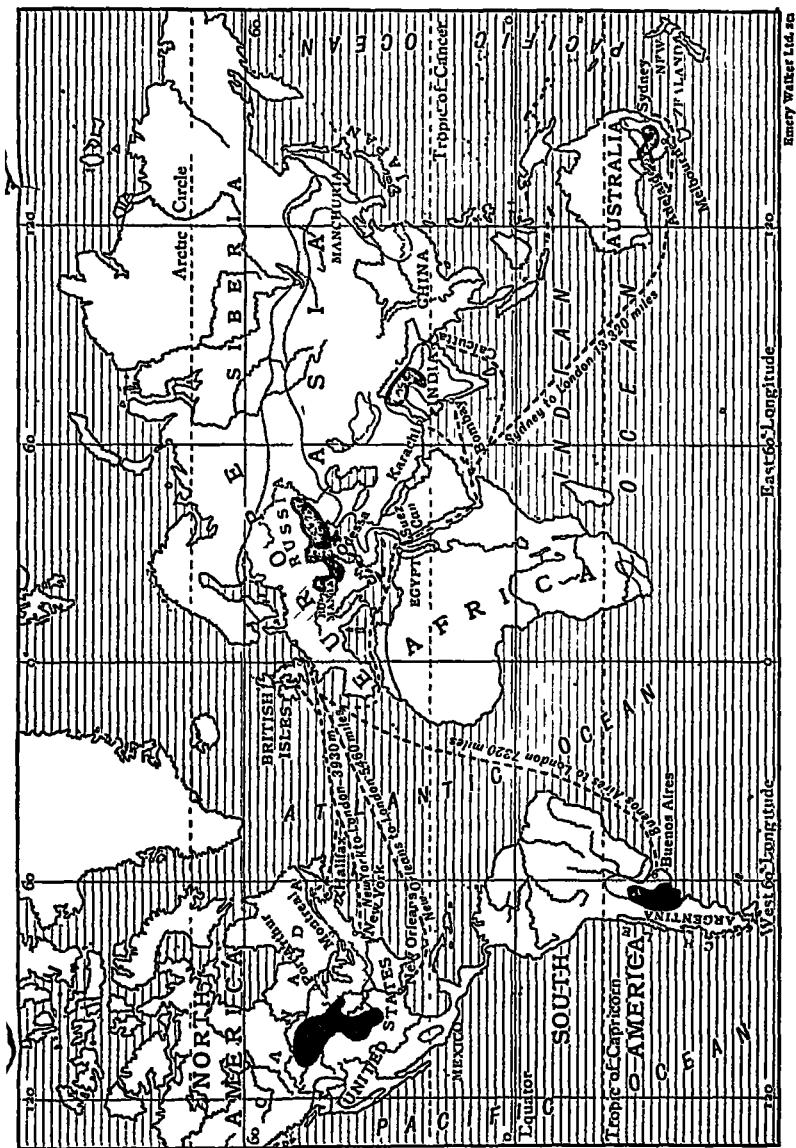


FIG 82.—THE WORLD'S CHIEF WHEAT GROWING LANDS  
Areas of heavy production are shown in black.

south-east of Australia. The widespread cultivation ensures that there is a succession of harvests, and the supply of material forming the chief food of the white race does not depend on the success of one harvest of any country. For instance, when it is autumn in the north temperate zone and the wheat is ripening, it is spring in

the south temperate zone and the wheat is only sprouting.

Notice in Fig 83

the relative impor-

tance of the chief wheat-growing areas. America is the great granary of the world, the area in U S A being specially important.

For successful production, wheat requires a cool, moist spring, followed by a warm, dry summer. A sunny harvest period is most important for the ripening, drying, and gathering of the grain. Climate is more important than soil, but a clayey soil naturally drained, and level for cultivation is the most suitable. Wheat cultivation soon exhausts the soil, and regular manuring is necessary.

The importance of transport facilities

is illustrated by the fact that the prairie of N America has only developed into a wheat area following on the construction of the railway routes. The wheat fields have followed the iron rail.

**Barley, Oats, and Rye** In some countries of Europe bread is made from rye flour, and is the so-called black bread of parts of Germany.

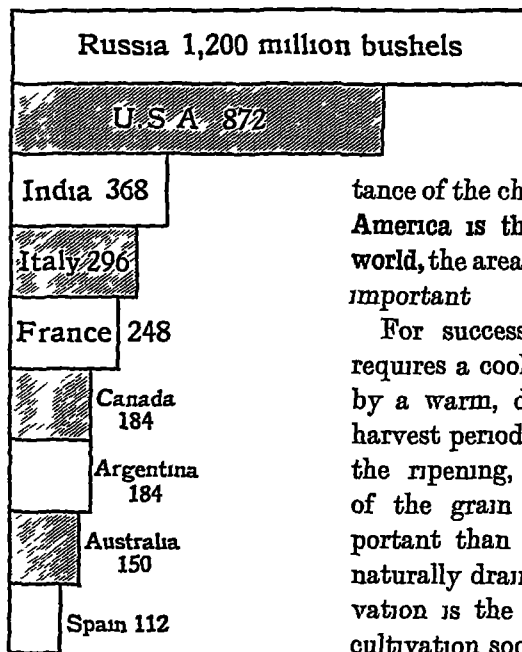


FIG 83.—WORLD'S PRODUCTION OF WHEAT, IN MILLIONS OF BUSHELS

and Russia Oats and barley are also, to a minor degree, foods for human beings Oatmeal is used in the manufacture of porridge and cakes, and barley flour was, at one time, largely used in the manufacture of bread Oats is the world's largest cereal crop, but the grain is usually grown for home consumption by animals, and is less important in commerce than wheat It can thrive on poor soils, and can stand a colder and damper climate than wheat

Barley was one of the earliest cultivated grains, and has the widest range of all cereals It will mature quickly, even in cool areas of the world It was the chief bread plant of the ancient world

Rye forms one of the chief foods of Europe, and can be cultivated on poor soils in cool countries Rye bread is the chief food of the peasants of all Europe east of the Rhine and north of the Alps

Maize is a stout annual grass, known in N America as *Indian corn* (or corn), in Hungary as *Turkish wheat*, in S Africa as *mealies* It grows in tropical and temperate climates, but during the ripening period it requires a high temperature by night and day, hence it does not ripen well in England The greatest maize-growing country is



FIG 84—MAIZE OR INDIAN CORN

U S A , in Mexico it is made into flat cakes called *tortillas*, and is the chief food of the people , it is extensively grown in Argentina, S Africa, Austria, Hungary, Romania, N Italy One acre of maize yields twice as much grain as one acre of wheat It is used both for human and cattle food , the unripe green cobs are used in America as a vegetable , *cornflour* is made from it , Italian maize meal is called *polenta*

**Canada** Most of the Canadians live in a narrow belt of country averaging about 100 miles wide, which stretches across the continent near to the boundary with U S A

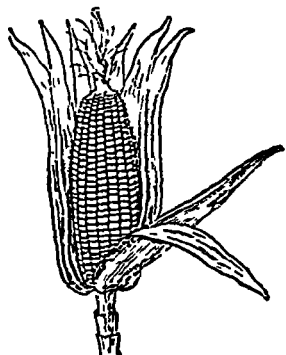


FIG 85 — CORN COB

Gradually the settlers, who first started in the east have cleared the forests, or ploughed the prairies, and made way for farming Canada is famous for her wheatlands of Manitoba, Saskatchewan, and Alberta Here the soil is clay , the frosts help to break up, and the warm *Chinooks* to dry the soil for ploughing , the rainfall is sufficient the summers are short but hot, and the summer days are long, ripening

the grain and allowing it to be harvested in good condition It is then stored in elevators ready for transport by rail to Port Arthur, or Fort William, on Lake Superior The elevators of these cities will hold 42,000,000 bushels of wheat It is transported by water to Montreal, where, in summer, ocean-going steamers convey it to Europe In winter, when the mouth of the St Lawrence is frozen, wheat is transferred by rail to an ice-free port like St John (New Brunswick) or Halifax (Nova Scotia)

**Winnipeg**, the chief wheat centre of Canada, is well supplied with railways and elevators to deal with great harvests The following



FIG 86—HARVESTING IN CANADA

list gives a good idea of the chief cereals grown in Canada in one year, the yield is given in millions of bushels

PROVINCE.	WHEAT	OATS	BARLEY
Saskatchewan	117	65	16
Alberta - -	67	50	17
Manitoba - - -	28	20	18
Ontario - - -	14	66	14
Quebec - -	9	47	4

It will be noticed from this table that Ontario, although not strictly a prairie province, is first in the production of oats and fourth in the production of wheat

**U.S.A.** In Fig 87 is shown the great wheat belt of the United States, and the following table gives some idea of the enormous crops produced in one year. The yield is given in millions of bushels.

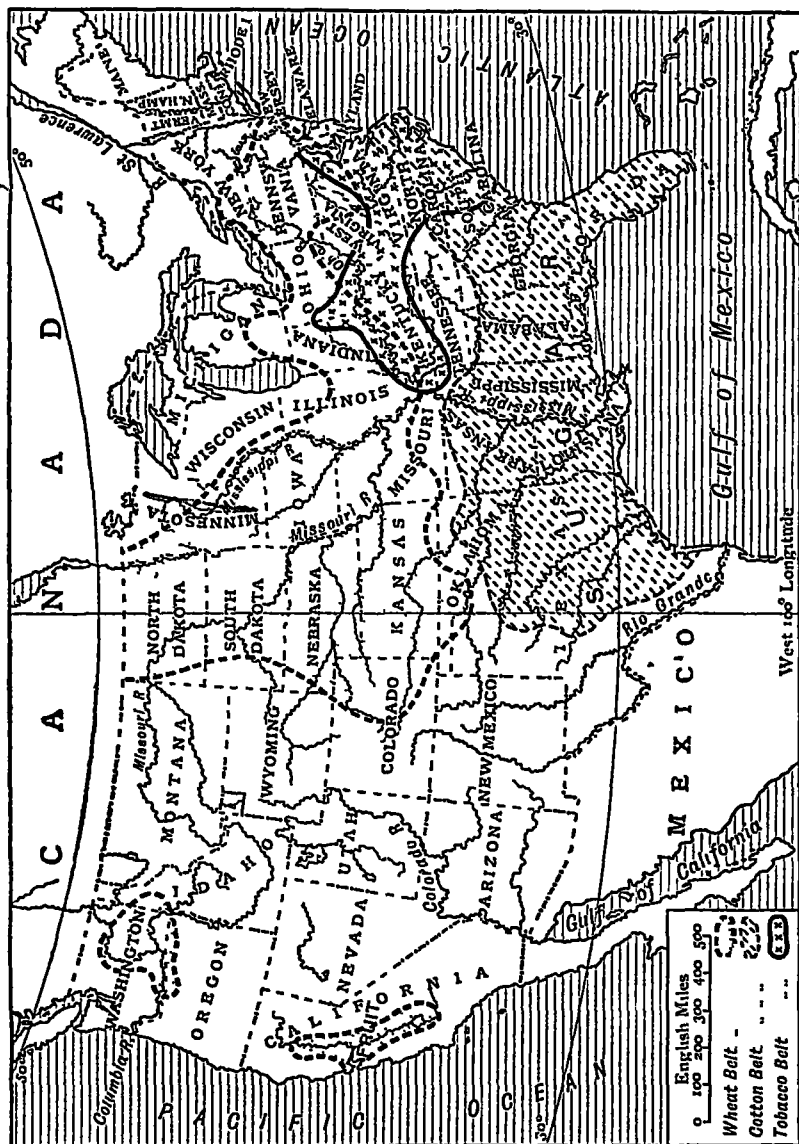
STATES	MILLIONS OF BUSHELS	STATES	MILLIONS OF BUSHELS
Kansas	158	Ohio	46
North Dakota	58	South Dakota	17
Nebraska	47	Pennsylvania	23
Oklahoma	65	Idaho	28
Illinois	45	Indiana	34
Washington	48	Oregon	20
Missouri	41	Colorado	15
Minnesota	35	California	16

It will be seen that the five states—North Dakota, South Dakota, Nebraska, Kansas, and Oklahoma—are cut by the hundredth meridian and are all partly on the lower slopes of the western mountains. These states continue southwards from the noted grain-producing states of Saskatchewan and Manitoba. It should be noticed that Kansas, in one year, produced more than twice as much wheat as any other state, but, naturally, the yield varies from year to year according to the weather conditions.

The three states of Washington, Oregon, and California lie along the Pacific coast, but the remaining states are in the neighbourhood of the Great Lakes, and are a continuation of the wheatlands of Canada.

Between North Dakota and Minnesota, extending into Canada, is the Red River Valley, which is such a prolific wheat country that it is known as the Bread Basket of the World. It is fifty miles across and some two hundred miles long, and is so level that after rain the water stands in sheets on the fields. The roads are elevated a foot or more above the land, there is nothing to break the view in whatever direction you look, except every half-mile or so a farmhouse with





a few trees around it. Fierce, blinding snowstorms are not uncommon in winter, as the winds have a free sweep across the land.

Ages ago the great ice sheet that overspread the northern part of the continent blocked the Red River Valley, so that the river could not flow in its natural channel to the Arctic Ocean. A lake was formed, which was larger than all the present Great Lakes put together. After the ice had melted entirely from the valley, the

river flowed again northward and the lake disappeared. The soil of the wheat region is the sediment of this ancient lake.

It is no infrequent sight on a great farm in North Dakota to see a row of twenty ploughs, harrows, seeders or reapers working at the same time. In addition to wheat, enormous crops of oats and barley, besides other cereals, are grown, for USA produces

one-sixth of the world's wheat and one-third of the world's oats

Maize, which requires a warmer climate than wheat, is chiefly grown farther south. You will understand what vast quantities of maize are grown in USA when you realise that the total yield of wheat in the year 1937 was 874 million bushels, and the total yield of maize was 2,644 million bushels—more than three times as much. The total yield of oats for the same year was 992 million bushels. Maize is generally called Indian corn, or simply corn, wheat is not called corn either in USA or in Canada. There is more maize flour eaten in USA than wheat flour.



FIG 88 —A STREET BAKERY IN MEXICO  
The cakes are Tortilla—made from maize flour

**Towns** Chicago, the biggest wheat market in the world, was mentioned on p 67 St. Louis, at the junction of the Mississippi and Missouri, is a noted railway centre and river port, well situated for dealing with grain, cattle, and lumber from the neighbouring states. Being in the midst of the maize area its chief industry is hog-packing, and as the cattle from the western plains are sent to the maize area to be fattened, it has a large canned-meat trade. From the state of Kentucky, tobacco is obtained for its tobacco factories, and oilcake is brought from the cotton plantations for the cattle.

Kansas City and Omaha, both on the Missouri, have meat-packing factories and a great trade in wheat, St Paul and Minneapolis, the twin cities, are specially noted for their flour mills, of which Minneapolis has the largest in the world, the power for these mills comes from the Falls of St Anthony on the Mississippi. Milwaukee, on the west shores of Lake Michigan, has noted flour mills.

**The Argentine** We have already seen that the pampas of Argentina is one of the world's greatest producers of wheat. In recent years a remarkable change has been wrought by the plough and the locomotive. The pampas has become one of the granaries of the world. It is intersected by railways which have been easy to build in these level plains. Farming is now conducted on a large scale with labour-saving machinery. The plain is studded with the estancia houses of great estates, each farmstead surrounded by its plantation of eucalyptus trees. Enormous crops of wheat and maize, besides oats, flax, and alfalfa for fodder, are produced.

**S. Africa** The important place which wheat holds in farming in Canada and Australia is in the S African Union held by maize. It is the chief crop, and mainly supports the five million natives of the country. The native mealies are *stamped* in a mortar with a pestle, and are usually eaten with *calabash* milk, that is, milk that has been allowed to ferment in a gourd-shaped vessel made from the bottle-necked vegetable called the calabash, which is skilfully hollowed

out by the natives    Crushed, or milled, maize grain is the principal food for live stock    Sometimes, the whole maize plant is cut before the grain ripens, and it is stored in silos for winter feed for stock    In hundreds of miles of maize fields, to save expense and labour, the seed is still sown broadcast—no harrows, planters, or cultivators



FIG 89—KAFFIR GIRL POUNDING, MEALIES

being used    This, however, is only on the large inland tracts    The maize belt covers a wide area in the eastern portion of the Union, chiefly in the Transvaal and the Orange Free State, maize is also extensively grown in Southern Rhodesia    The following list gives the production of maize for one year, excluding native locations and reserves    *Cape of Good Hope*, 143 million lbs, *Natal*, 213 million lbs, *Transvaal*, 1,273 million lbs, *Orange Free State*, 1,118 million lbs

**Australia**    Wheat is the main grain crop in Australia of which a surplus is grown for export    The climate and soil in certain parts are suitable for wheat growing on a much larger scale than is at present possible, owing to

the lack of farmers    The wheatlands are great open spaces, where the farmer uses ploughs which turn many furrows at once    They are drawn by many horses, or pulled by a petrol motor    A team of twelve to fourteen horses is used to harrow the ground, and one team can cover 100 acres a day    A combined harvester is used, which delivers the grain in bags by the side of the machine, the bags are then sewn and carted to the railway    Wheat is grown in Australia in the regions of winter rains

The irrigated districts of *Riverina* in New South Wales, and the *Wimmera* of Victoria, are the best wheat-growing areas. These districts are shown in black on Fig 82. Good wheatland is found on the natural grassland and in parts of the scrubland and savannah country. The scrubland is covered with a dwarf eucalyptus about two feet high called *mallee*, it is rolled down and burnt off when dry, and the land is gradually cleared for wheat and other crops. The trees of the savannah—pines and eucalypts—are easily destroyed.

Some wheat is grown in New Zealand, but in most years there is not enough for the people's needs, and wheat has to be imported.

On the hot, moist coastlands of Queensland, and the north-east of New South Wales, maize is grown, but not in sufficient quantities for Australia's need, and some is annually imported. Oats is the chief crop in the cool wet lands of Tasmania and South Island, New Zealand.

India formerly grew much more wheat than at the present time, and its export has almost vanished, so that the wheat port of Karachi near the Indus mouth has now lost some of its former importance. Owing to the monsoon, wheat is grown most successfully as a *winter* crop in the Punjab and Central Provinces.

Oats are little grown in Asia except in Siberia.

Barley is largely grown in India on the lands between the wheat and the rice belts. India, too, has a large crop of maize on the higher ground of the Punjab and Ganges valley, it is grown for human food.

**Europe** Before the Great War, wheat was largely grown for export in the Ukraine area of S. Russia, but exports have not yet been resumed on a large scale. A noted wheatland is the **black earth region**, which extends from Romania along the Black Sea and the Sea of Azov to the southern end of the Urals (Fig 91). The Danube ports of Ruschuk and Galatz are great grain shippers.

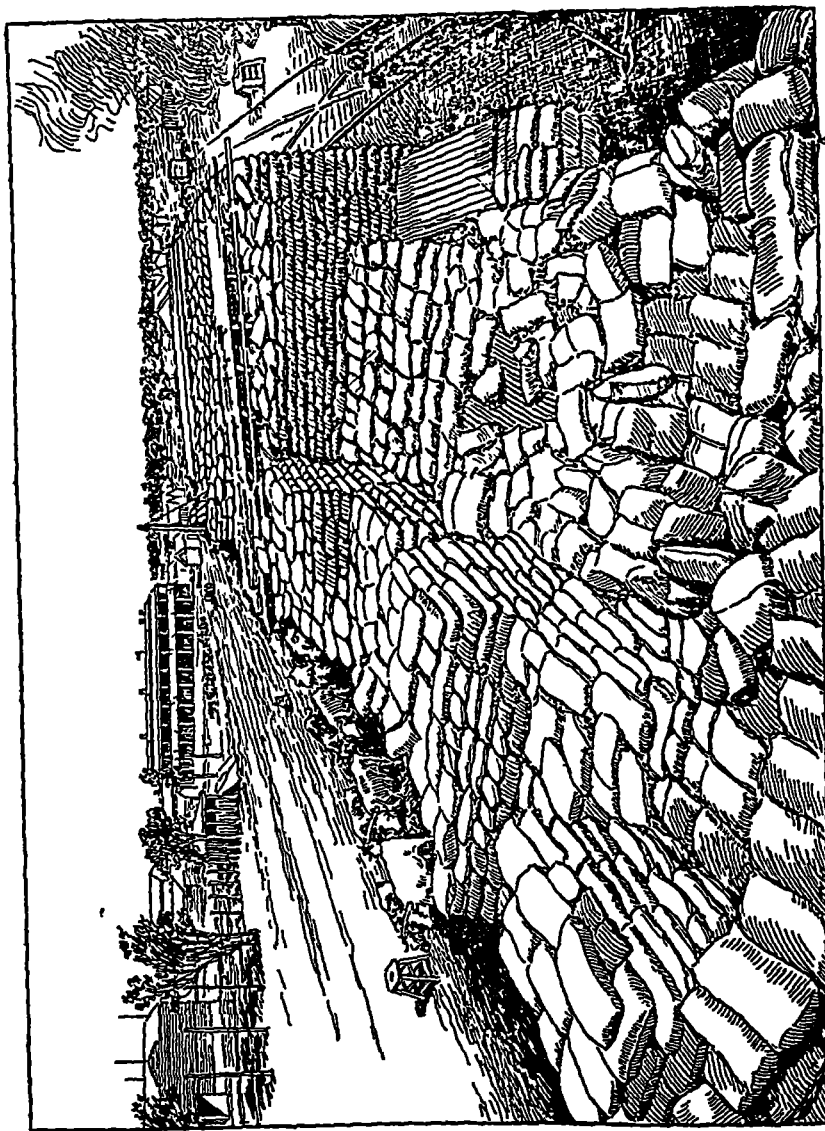


FIG 60.—WHEAT AT SIDING BELLY FOR TRANSPORT—AUSTRALIA

Heavy crops are also grown on the Hungarian Plain, southern Germany, north-east France, and Italy. Both France and Italy grow almost enough for their own needs.

Oats are grown in enormous quantities in the cool damp regions of N. Europe. Denmark and Flanders have specially large crops in



FIG 91—RUSSIA—NATURAL REGIONS

connection with the dairy industry. The warm, dry Mediterranean lands are unsuitable for oats, and both Hungary and Romania are small producers, but these two countries grow large crops of maize, both for home consumption and export. Maize is grown in Italy on the irrigated lands of the Plain of Lombardy.

In the **United Kingdom** the wheat fields are *mainly* situated in East Anglia, but the crop is insufficient for our bread supply. Large

quantities are imported annually, nearly half the quantity required coming from N America Oats are chiefly grown in the cool northern districts, barley in East Anglia, for the making of malt The

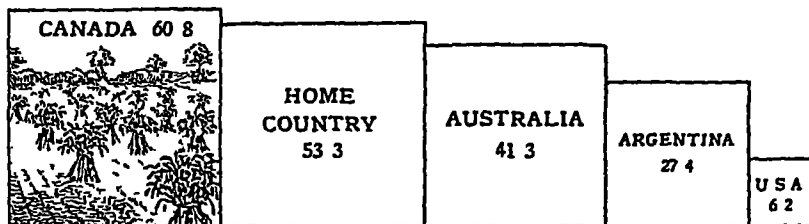


FIG 92 — BRITISH SOURCES OF WHEAT SUPPLY FOR ONE YEAR, IN MILLIONS OF BUSHELS

climate of the British Isles is unsuited to the growing of maize

Britain is by far the largest buyer of wheat The sources of a year's supply are shown in Fig 92

### Notes.

**Cornflour** is finely ground corn It was formerly made entirely from maize, but the name is now used for other cereals similarly prepared It is used with milk, sugar, and flavourings, for puddings

**Polenta** is a favourite food in Italy It is maize meal porridge served hot with milk and salt or sugar When cold it is cut into slices powdered with grated cheese, and fried

**Tortilla** is the flat cake made from maize flour, the Mexican "bread"

**Mealies** is the S African name for the maize cob The name is also applied to the whole plant Mealies is the principal food of the native races of S Africa

**Black Earth** A name given to the rich soil of the fertile steppe lands of S Russia During the Ice Age, flooded rivers from the glaciers spread over the land and deposited thick layers of sediment on which are now grown enormous quantities of cereals

**Macaroni** is a food made from hard wheat, especially in Italy The flour is kneaded into a paste, which is pressed through holes in the bottom of a cylinder The long tubes are cut into lengths and dried The paste is also made into solid cord like lengths called spaghetti, and finer lengths of the same substance are called vermicelli



Chinook winds are wet westerly winds from the Pacific, which blow over the prairie lands of Canada, after they have been dried by their passage over the Rocky Mountains. These winds are so called after a former tribe of Chinook Indians who lived in certain valleys of the Rockies. The Chinooks of spring have marvellous power in melting the winter snows of the plains.

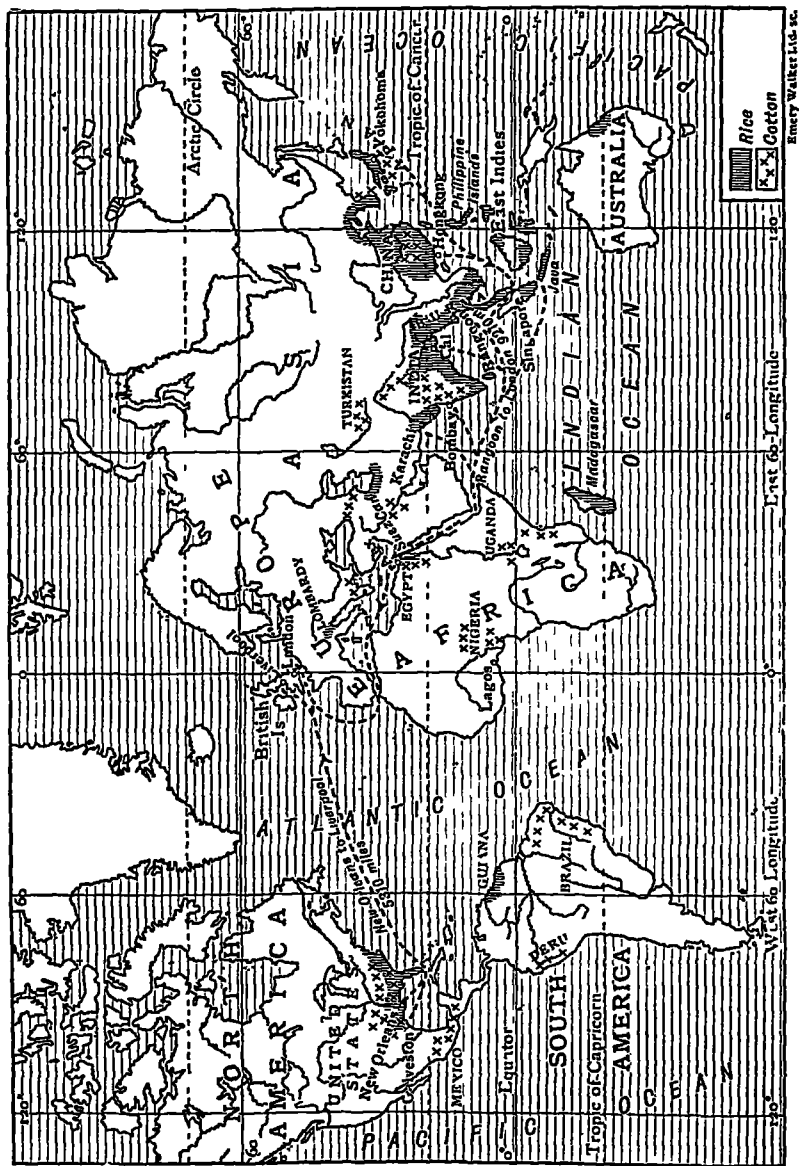
### Exercises.

- 1 Explain the map, Fig 82
- 2 Give the routes by which wheat may be brought to London from other parts of the world
- 3 What natural conditions are best suited to the cultivation of wheat?
- 4 Compare the methods of wheat cultivation in Australia with those in England
- 5 Write a short account of the importance of maize growing
- 6 Explain the following black bread, Ice Age, cereals, temperate climate, irrigation
- 7 How can you account for the following facts (a) maize is more important than wheat in S Africa, (b) rice is more important than wheat in India, (c) wool is more important than wheat in Australia?
- 8 Give the situation of the following Lombardy Plain, Black Earth Region, Finland, Alberta, Red River Valley, Kansas State
- 9 Explain the following Britain is by far the largest buyer of wheat
- 10 Explain the illustrations, Figs 88, 89 and 90
- 11 Explain the following America is the great granary of the world
- 12 State the situation of six ports, outside Europe, that deal in wheat exporting
- 13 Explain the positions of Chicago, St Louis, Buenos Aires, Odessa

## CHAPTER XII

### ESSENTIAL FOODS—RICE AND MILLET

Rice is the most important food grain in south-east Asia, an area extending from India to Japan, and including Burma, Siam, Indo-China, China, and the adjacent islands. Notice on Fig 93 that rice is the characteristic product of the plains of the monsoon lands. Rice is also produced on the Nile delta of Egypt, the



### FIG 93--RICE AND COTTON LANDS

Lombardy Plain of Italy, and on the coastlands and river lowlands of Louisiana, Texas and Arkansas (U S A ) The diagram, Fig 94, shows the relative importance of the rice-producing countries

China the chief producer, grows rice on the coastal plains and terraced slopes of the south-east, but only a part of the population depends chiefly on rice for food It is the principal cereal grown in India, though it is the staple food in some districts only

The Lower Ganges plain, which is subject to monsoon rain and floods, is the chief growing area, but much rice is also grown on the

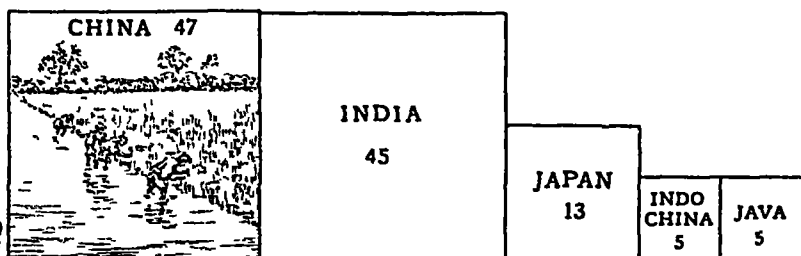


FIG 94 — THE WORLD'S CHIEF SOURCES OF RICE (MILLIONS OF TONS)

river deltas of the coasts The river valleys of India are so densely populated that there is little rice left for export, but Burma, which is thinly peopled, exports enormous quantities Rangoon is the chief port

Other large supplies of rice come from Cochín-China and Siam, but in other countries there are not great quantities left for export Japan cannot grow enough for her own needs, and much is imported

The food value of rice is small compared with wheat, and this is noticeable in the remarkable difference in physique between the rice and the wheat eaters The grain is poor in fats, and its use is largely supplemented by soya beans and fish It has very little flavour, and much use is made of spices and flavouring material in preparing it

**Rice-growing in India.** There are two distinct varieties—hill and swamp rice. Hill rice requires comparatively little water, but swamp rice, as the name indicates, can be grown in very wet regions. The production of the first named variety is small, and swamp rice is the rice of commerce. The seed is sown in flooded ground, and when the young shoots are a few inches high they are taken out and planted in the paddy fields or rice fields. Each field is surrounded by a bank, at the top of which is a trench which carries water from a well, canal, or river. Before setting the plants, the surface is scratched over with the wooden plough drawn by oxen. The ground is not ploughed deeply as it is in England. When the land is ready, a hole is made in the bank, and the water pours out and floods the field. The rice plants are set in swampy mud, and the field is always kept in this condition. While the rice is growing the men work up to their knees in water, pulling out the weeds, which grow very quickly in this hot country. As the grain ripens, the water is drained from the fields, and the crop is then cut with short sickles. Rice grains do not come out of the husks as easily as wheat and barley, so the heads are put in a bowl-shaped stone and are beaten with a heavy wooden club. Sometimes the rice is laid in heaps on the ground and a team of four or five oxen trample out the grain, walking round and round a post to which they are tied.

There are various ways of separating the rice from the husks. A usual way is to put the mixture out in the wind and move it about on big bamboo shovels, until only the grain remains, or to let it fall from baskets when the wind is blowing.

Rice in the husk is called *paddy*, in Japan, the national drink, *saké*, is made from rice.

In China fields of hay or clover are almost unknown, the low-lying valley lands being given up to rice-growing. Irrigation occupies much of the peasant's attention. In the southern provinces cattle are often employed to turn the water-wheel, and an ox

patiently tramping round and round under a thatched hut is a common feature of the landscape. No walls or fences mark the boundaries of the rice fields. The sections are divided by low mud mounds, which afford paths broad enough to walk on when dry. The Chinese cling to the elementary ways of their forefathers. A heavy roller is drawn over the rice to grind it into flour, and the



FIG 95.—INDIAN NATIVE GOING TO THE PADDY FIELD WITH HIS PLOUGH AND CATTLE

worker sweeps the grain into heaps for crushing. Outside the door of his hut the worker sifts his grain in an open basket over a large wicker pan.

It should be noted that people like the Hindus and Chinese are not generally commercial people. They are *self-centred*, that is, they are able and content to supply practically the whole of their own wants, and they are very little concerned about the doings of other people.

The Japanese peasant is an exceedingly industrious person, and the man on the land toils as few peasants in the world have ever been known to toil. There is practically no machinery in use, nearly all the work being done by hand, hoe, and spade, helped out at times by the ox or the horse. A marked feature of the country is the extraordinary care with which the hills are terraced from base to summit, wherever a single ear of rice or other cereal can be made to grow. More than two-thirds of the cultivated land is planted with rice, and when the young shoots are transplanted from the nursery beds about the end of May, to be re-planted in the paddy fields, thousands of men and women can be seen bent double in unceasing toil knee deep in water and liquid mud. When harvest time approaches the fields are dotted all over with tiny flags of bamboo and paper, inscribed with charms to protect the crop from birds and insects.

Millet is a general name for a number of small-grained cereal grasses grown either for fodder or for food. There are hundreds of varieties which may differ very widely in appearance. The *Great Millet* or *sorghum* is grown extensively in the drier parts of India such as the Deccan and Central India, parts of China, and especially in Manchuria. Millet makes a good bread-flour and provides the staple food for millions of people where rice is not available. A variety known as *dura* Guinea Corn, or Kafir Corn, is largely grown both for native food and cattle in many parts of Africa where maize is not grown. In U.S.A. it is chiefly grown in the West Central States in place of maize for cattle food. Both in Italy and U.S.A. the *Broomcorn* millets are specially grown for their stiff heads which are dried for use as carpet-brooms. These stiff-headed millet brooms will probably be familiar to you. There is very little trade in millet, nearly all of it being grown for local food of either the people or cattle, but it should be clear that millet is an important cereal in hot countries.

**Irrigation** We have seen how important it is to the rice-grower that he should be able to supply his crops with water at certain seasons, and as this necessity has much commercial importance in the cultivation of other crops, it will be as well to consider a few methods by which irrigation is carried on

Irrigation from the Latin *irrigare*, to water, is a method of supplying water to land in order to make useful crops grow. In many parts of the world where the land is fertile enough to grow fruit, grain, vegetables and other crops, there is not enough rain in summer to keep the plants alive. The heat of summer in many of these places is great, and the land is frequently an arid waste covered with scrubby bushes, cactus plants, and other such growths. But millions of acres of land in America, Africa, India, Australia, and other countries have been reclaimed from waste and made fit to grow profitable crops by means of irrigation. The three chief means of irrigation are the annual floodings of rivers, the construction of dams and reservoirs, and artesian wells.

**River floods** Egypt depends almost entirely upon irrigation by natural flooding, with the help of huge dams to regulate the flow of water. The area of Egypt is about 380,000 square miles, but only 12,000 square miles in the Nile valley and Delta are cultivated. The inhabited portion of the country beyond the Delta stretches like a narrow ribbon through the desert on both banks of the Nile, with an average width of only seven miles. In this narrow ribbon and in the Delta live 16,000,000 people, of whom the greater number are engaged in agriculture. The reason for this is that only so far as the Nile floods the land, or as the water can be lifted from the river to irrigate the land, can crops be grown and people live. Once each year the Nile itself irrigates the land, slowly, steadily rising as the flood waters come down from the mountains, spreading over the land and, when the floods subside, leaving behind a layer of fertilising mud. The Delta is the silt of the Nile, and the whole

life of the millions of people depends upon the river, hence the ancient saying, "Egypt is the gift of the Nile"

The native method, centuries old, of lifting the muddy water from the river is by means of a *shaduf* or water-lift, which consists



FIG 96—A SHADUF FOR IRRIGATING THE LAND—EGYPT

of a pole, so fastened that it can swing on the top of a post. On one end of the pole is hung a closely-woven basket, or a leathern or earthen pot, with which to scoop out the water, at the other end



is fastened a heavy lump of mud to counterpoise the weight of the water.

**Barrages and Reservoirs.** The bed of a river is generally below the level of the surrounding land, and it is usual to construct a barrage or dam across the river bed, so as to raise the level of the river sufficiently to direct part of the water into canals. The canals run into numerous branches about the land needing water. But, to make fuller use of the water, and prevent it running to waste, immense dams, and reservoirs like lakes, are built for the imprisonment of the water. Then, in the dry season, the huge doors in the dams are opened, and the water is conducted through hundreds of channels to water the crops. The most important government irrigation works in U S A, India, Australia, and Egypt are based on this plan of forming reservoirs to hold the surplus river water. The great Aswan dam across the Nile is a wonderful engineering work of solid masonry built by British engineers. It is  $1\frac{1}{4}$  miles long, and has 180 steel sluice gates worked by machinery which are opened during the season of floods, and afterwards gradually closed to hold back the water needed for irrigation.

In January, 1926, the great Sennar Dam, two miles long, was completed. It crosses the Blue Nile at Makwar, and, by the use of numerous canals, provides water for many thousands of acres of cotton land in the Sudan.

**Artesian wells** are really artificial springs that have been made by boring in the earth. It frequently happens that the layers of rock some feet below the surface are slightly tilted inwards, something like a very large soup plate, and it also happens that rain can readily pass through the upper layers of rock to accumulate at a greater depth on rock through which the water cannot readily pass. When deep borings are made down to the rocks where the water lies, it is forced up the tube and overflows. These borings are called artesian wells because they were first constructed in Europe in the province of

Artois, in France The boring is made by means of an instrument like a large corkscrew The water does not always overflow the top of the well, everything depends on the level of the rocks below, hence the water has then to be raised from the well by hand or by machines In India some 12,000,000 acres of land are irrigated from wells from which water is laboriously raised by hand and by primitive machines Large leather sacks or pouches, holding as much as thirty gallons of water, are drawn from wells by bullocks, and the water is poured into ditches leading to the ground under cultivation In America pumping windmills are widely used A great number of artesian wells have been made in recent years in Queensland, New South Wales, and other parts of Australia, where there are vast artesian basins This water is used for the great flocks of sheep and herds of cattle, as well as for the crops From some of the wells 1,000,000 gallons of water a day are poured out

### Note

Soya Bean is a native plant of China, Japan, and the Moluccas It contains certain nutriment which is not found in rice, hence it is an important food in Japan and parts of China and India, and it is the *staple food* in Manchuria The yellow variety is highly prized in Manchuria for its oil, which is used for cooking and lighting, the residue is exported to Japan for fertilising purposes Large quantities are also used for oilcake to feed cattle In Britain, the bean is used as a vegetable, and is imported mainly from Russia, China, and Japan

### Exercises.

- 1 Explain the map, Fig 93
- 2 Describe the route by which rice is shipped from Rangoon to London
- 3 Write a short summary on the cultivation of rice
- 4 What are the natural conditions for the successful cultivation of rice ?
- 5 Explain the term *self centred* as applied to certain people
- 6 State various means by which land is irrigated
- 7 Give the situation of the following places Rangoon, Manchuria, Guinea-Coast, Sudan, Sennar, Deccan, Siam, Louisiana
- 8 Explain the term, "Egypt is the gift of the Nile"
- 9 Explain the illustrations, Figs 94, 95 and 96

## CHAPTER XIII

## ESSENTIAL FOODS—FISH

FISH is an important part of the food of man in every country of the world, and the waters of the earth contain an abundant supply



FIG 97—NATIVES FISHING IN ASSAM

Each country in contact with the sea, rivers, or inland waters like the great Lakes of Canada, to some extent or other, obtains part of its food supply from the waters close at hand

In dealing with fish we have to consider deep sea, inshore and river fisheries

**Deep Sea Fisheries** The chief fishing grounds are situated in those parts of the seas and oceans where there is comparatively

shallow water caused by submerged banks, and where there is a cold current. In shallow water there is seaweed in which the eggs are hatched, and the small fry on which fish feed drift with the current from polar latitudes. Thus the Dogger Bank of the North Sea, and the Banks of Newfoundland are the chief fishing grounds, because the currents about these banks come from the north. The principal fish caught are cod, hake, halibut, plaice, and haddock. The work is carried out by steam-drifters and trawlers, the drifters catching the surface fish and the trawlers the fish inhabiting the deeper water. Fishing ports on the east of England and the west of Europe send boats to the Dogger Bank.

**Inshore Fisheries.** Herring, pilchards, mackerel, and sardines usually inhabit the shallow waters near coast lands. The herring fishery off the east coast of England is important, mackerel are caught in the English Channel, the pilchard fishery flourishes off the coast of Cornwall and Devon, and the sardine fishery is an important industry round the shores of the Mediterranean Sea.

The herring fishing season starts off the north-east coast of Scotland during the spring of the year, and as the year progresses different parts of the coast become centres of activity. The swarms of herrings migrate southwards, and finally the fishing season ends off the coast of Yarmouth and Lowestoft in October.

Peterhead, Aberdeen, Stonehaven, Dundee, Whithy, Grimsby, Yarmouth, and Lowestoft each become, in turn, the herring centre. The herring fleets, and the girls employed in cleaning and packing the fish, move southward from port to port as the fish migrate.

**River Fisheries** The most important fish caught in rivers is salmon, and the chief salmon rivers are those of Norway, Scotland, and British Columbia. At certain seasons of the year the rivers of British Columbia teem with salmon, and advantage has been taken of this to develop a large trade in that fish.

ocean, takes the first position in the world's production. Fish is an important food in Japan.

Ports suitably placed to participate in the fishing industry develop into busy industrial centres in many directions. Salting, curing, and preserving fish give employment to many people other than those actually engaged at sea. Boxes and barrels must be made, and this demands an import of timber and the employment of skilled woodworkers. Fishing boats are usually built at the fishing ports, and this creates a shipbuilding industry. The waste fish

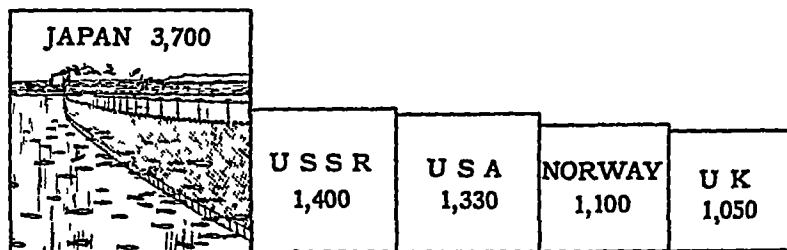


FIG 98—A YEAR'S FISH PRODUCTION IN MILLIONS OF TONS

is used in many minor industries for the preparation of fish oil, manure, and glue. Finally, the fishermen form only a small percentage of the workers at the ports.

The fish gather about the **Grand Banks** to feed on the vast ocean of living slime brought down by the Arctic current. This slime-food feeds tiny fish which are eaten by the herring, and the herring, with multitudes of smaller fish, are in turn devoured by the cod—the most important fish caught. The fishermen have to face fog, rain, snow and blizzards, and in the darkness or thick fogs icebergs may crush their little vessels. The men build their own craft, which are known as *bankers*. Small, flat-bottomed *dories* are sent out from the bankers to bait and let down the lines. The fish must be cleaned and packed away the day it is caught. The fish are slit open and cleaned, the cod-livers from which cod-liver oil is made

are kept apart, and the rest of the fish is rubbed with salt. The Banks, which are 1200 miles long by 300 miles wide, are a day's sail from the island, so the fishermen only return to harbour at intervals to land their *catch*, and to take in fresh stores for themselves. Great loads of cod-fish are landed on the quays of St John's and then weighed, some to be packed in ice and moss for export, some to be dried on flakes. These fish flakes are raised platforms of wood

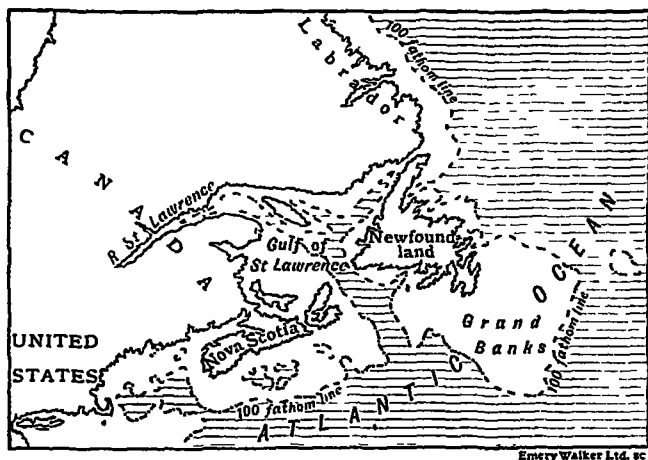


FIG 90—THE GRAND BANKS OF NEWFOUNDLAND

through which the wind can blow and dry the fish, which is then exported mainly to the countries of Southern Europe, Brazil, and the West Indies.

Of the Canadian fisheries Nova Scotia lands one-half the catch and New Brunswick one-fifth. The fisheries of the Great Lakes yield white fish, trout, sturgeon, etc.

The two New England States of Massachusetts and Maine land one-half the U.S.A. catch.

British Columbia on the Pacific coast leads all the other Canadian provinces in the *value* of its fisheries. On the Fraser river are some

of the largest fish canneries of the world The fish are caught when they come up the river to spawn The typical salmon hatched in the river goes away to sea when about two years old, and about two years later it returns to spawn in fresh water

The salmon come in such numbers that they almost choke the rivers, leaping as much as six feet out of the water to clear the waterfalls They are caught in nets of various kinds, and also in salmon wheels, which are kept in motion by the river current, and which scoop the fish up and throw them into a tank

Salmon are also obtained from the Snake and Columbia rivers of N W United States

In Norway, Sweden, Maine (U S A ) and Quebec there are "land-locked salmon" which never reach the sea but live always in lakes

In England and Scotland salmon are mostly caught by rod and line, and that mainly for sport, although the salmon fisheries of Great Britain produce about £1,000,000 a year

**Norway.** The N European fisheries extend from Spain to the Arctic, the North Sea being the most important area Norway has the largest trade, and it is the only country in Europe that exports more fish than it retains The Lofoten Islands, within the Arctic circle, are the centre of the cod fishery The herring fishery is concentrated round the fiords near Bergen, where it gives rise to great industries on shore The rivers of Norway, too, abound in salmon, which are mainly dried and smoked The Norwegian whaling and sealing fleets venture far beyond the North Cape to Spitsbergen, Franz Josef Land, and even along the northern shores of Siberia—the North-East Passage

**England's Fisheries** Hundreds of ships on the east coast of Britain are engaged in the fishing industry Steamships are, naturally, fast taking the place of sailing vessels, and among the fishing fleet will be found *Long Liners*, *Drifters*, and *Trawlers*

The *Long Liners* go in search of fish that can be hooked—cod, haddock, halibut, whiting—and they carry with them such a great number of lines, that, when fastened together, they stretch for about eight miles. At intervals of every three yards a *snood* or small line with a baited hook is fixed to this huge line, thus, when all is ready,

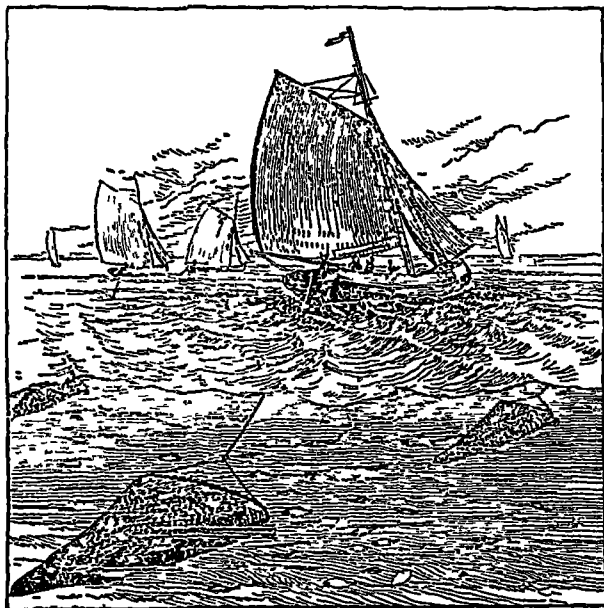


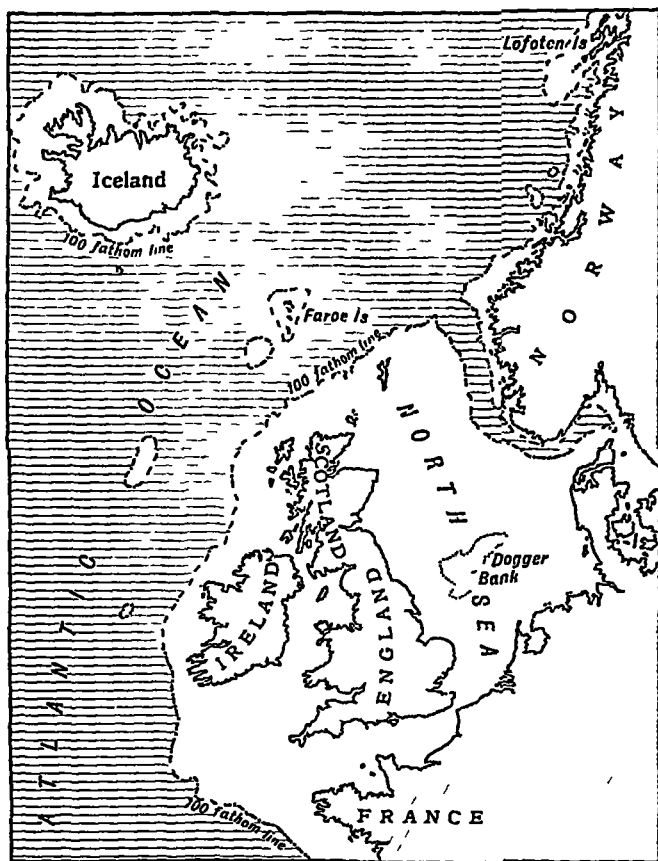
FIG 100 —TRAWLING

some 5000 hooks float just above the sea bottom. The cod, as they are hauled up, are pitched into a deep well at the bottom of each ship.

The harvest time for *drifters* is from June to October, when herrings in millions swim slowly southwards from the north of Scotland to the English Channel. Swarms of seagulls and schools of porpoises follow the strange boiling of the water, and thereby apprise the



fishermen of the position of the shoals The nets used by the drifters may be 120 yards long and about 12 ft deep A line of large corks



Emery Walker Ltd

FIG 101 —MAP OF WESTERN EUROPE, SHOWING THE DOGGER BANK AND 100 FATHOM LINE

keeps the top part of the net on the surface, while the bottom is held down by leaden weights If the fish are plentiful, many nets are joined together, and the invisible curtain stretches away for a mile

or more The ship then *drifts* with the tide, and the fish, swimming towards the net, are caught by the gills and suffocated in the meshes that are only big enough for them to poke their heads through

Back in port, the fish are sorted and piled in heaps on the dock-side to be sold by auction Vast quantities of herrings are cleaned and packed in salted barrels by Scots fisher-girls who are able to



FIG 102—SCOTS GIRLS GUTTING HERRING

clean them at the rate of sixteen a minute These salted herrings are mostly exported to Europe

Millions, however, are still left Some are threaded on sticks and placed over smoking oak fires to be changed into kippers and bloaters Others are bottled, tinned, or made into bloater paste

Trawlers drag the sea bottom with trawl nets for turbot, skate, sole, plaice, and other fish The trawl net is really an enormous bag, some 80 ft wide, and as the trawl is drawn through the water

by the steam trawler, an overhanging top forces the fish inside. The catch is sorted, packed in ice, and taken to Grimsby or some other port, whence the fish is transported by rail to market.

Britain imports nearly £10,000,000 worth of fish annually—fresh fish for salting and curing from Norway, Denmark, and Holland, sardines from Norway and Portugal, canned salmon from Canada and U.S.A. The total exports are £3,700,000 worth, mostly as salted or cured herrings to Russia and Germany.

### Notes

**Dogger Bank**, a shallow area of the North Sea situated off the coast of Yorkshire. The food necessary to support fish life is more plentiful in shallow waters than in the deep sea.

**Pilchards**, small sea fish similar to herrings but thicker and rounder. They are mainly caught near Cornwall.

**Sardines**, small fish of the herring family abundant near the isle of Sardinia. They are tinned in olive oil for export.

**Billingsgate Market**, on the left bank of the Thames, near London Bridge. The market was established in the reign of Queen Elizabeth. The present buildings date from 1874.

### Exercises

- 1 Name, with examples, three types of fisheries.
- 2 Describe the route by which tinned salmon is conveyed from British Columbia to England.
- 3 Write a short summary of the Newfoundland fishing industry.
- 4 State the situation of the following: Bergen, Fraser River, St John's, Peterhead, Lofoten Islands, Massachusetts.
- 5 Give the names and positions of six fishing ports in Britain.
- 6 Explain the following terms: trawlers, drifters, drift nets, cod liver oil, ice floes.
- 7 Why is there little international commerce in fish? What do you know of Britain's share in it?
- 8 What fish are caught near Britain? Why does Britain import fish?
- 9 Where are river fisheries more important than sea fisheries?
- 10 Write a list of the important fishing peoples of the world. Give reasons for their importance.

## CHAPTER XIV

## TEA, COFFEE, COCOA, SUGAR

TEA, coffee, and cocoa are each produced from shrubs which grow in certain parts of the tropics. They require hot summers with frequent rains, and the first two grow best on hill slopes. The shrubs are cultivated on plantations, and it is necessary that cheap labour should be available, since all the work is performed by hand. It is only since the opening up of the world by the great explorers that these products have become so universally used by civilised peoples, but they are now looked upon as necessities. The greatest tea drinkers are the Chinese, the British, Russians, Dutch, Australians, and South Africans. Coffee is consumed more than tea in France, Holland, Germany, and America. Cocoa is largely used in Spain and Portugal, but generally it is an article of commerce more for the manufacture of confectionery than as a beverage.

**Tea** Study the map, Fig 103, which shows the importance of the chief tea-producing countries of the world. It will be seen that the production is confined to the monsoon-region of Asia, an area with a very hot, wet summer. The areas of heavy production are shown black in the world map. The diagram, Fig 104, shows the world's annual production of tea in millions of lbs.

Tea is the name given to the dried leaves of an evergreen tree. The best leaves are the young ones, and, as these are gathered first, the earliest crop is the best. Tea in India and Ceylon is grown in large plantations under the supervision of white men and much machinery is used in the preparation. In China and Japan, tea is grown chiefly by peasant proprietors on small plots, and it is prepared entirely by hand.

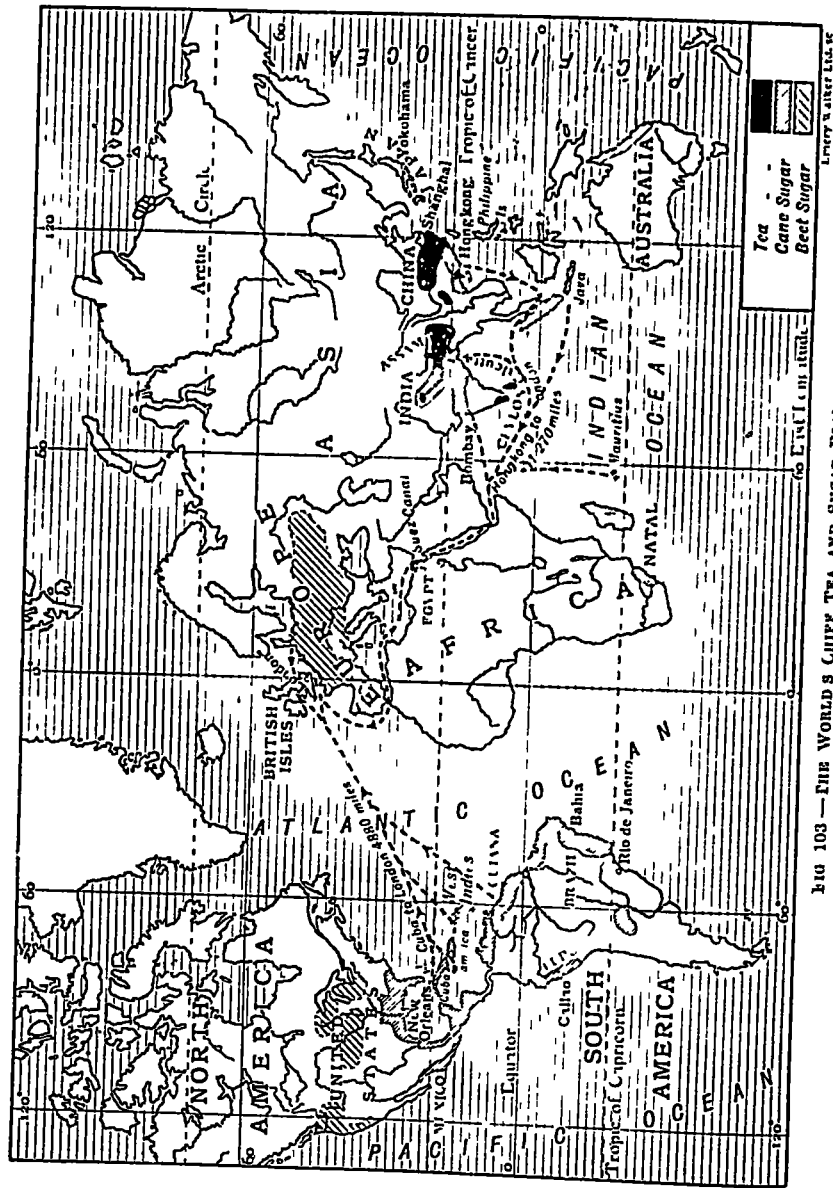


FIG 103 — THE WORLD'S CHIFF TEA AND SUGAR PLANTATIONS

The chief tea-growing province of India is Assam, and the town in the heart of the industry is Darjeeling in the adjacent province of Bengal. This district is the wettest part of India, many torrents rush down from the mountains, overflow their banks and turn the land into a swamp, and in addition to this there is a very heavy rainfall. The tea plantations are made on the hill slopes, because, although tea needs plenty of water, it must not *stand* in water. The tea bushes present a curious appearance. They are kept low,

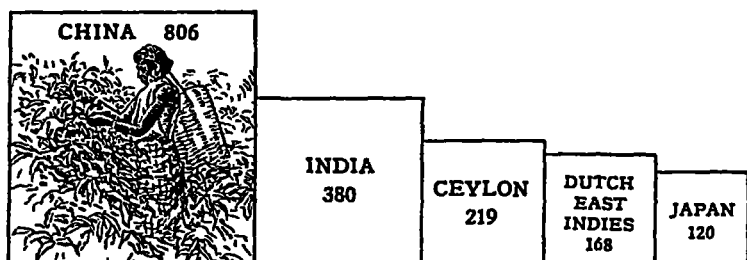


FIG 104.—THE WORLD'S ANNUAL PRODUCTION OF TEA IN MILLIONS OF LBS

broad, and flat as a table by clipping. This is done so that the leaves can be readily plucked, and to induce the trees to grow leaves instead of wood. In the moist and intense heat, weeds grow very rapidly, so there is constant labour for the coolies, men and women, to keep the plantations free of weeds. Sometimes, when the rains are very heavy, the coolies have to work all day knee-deep in water and mud, beneath a burning sun. The top leaves of the tea shoots are picked and placed in deep baskets which the coolies carry on their backs. When the baskets are full they are taken to the factory, where they are weighed, so that the amount each coohe has picked can be recorded. On some plantations a wire cable is stretched from the hillside where the tea bushes are growing, down to the factory, and the filled baskets are hung



FIG 105.—THE NURARA LINA RAILWAY WINDING UPWARDS THROUGH THE PLANTATIONS  
NEAR HIGHEST POINT OF CLYON

on the cable, so that they quickly slide down to the receiving sheds

Inside the factory are rows of shallow canvas trays called *tats*, and the newly plucked leaves are placed on these, and left for a day and a night to wither. The next day the leaves are put into a rolling machine, and pressed and squeezed until a huge wet mass comes out from the rollers. Parts of this mass are then put on to other trays and left to ferment until the correct aroma is obtained. This is a most important process. The tea must be carefully watched all the time for should it have too long or too

short a time for fermentation the flavour will not be right. There is a delicious odour in the fermenting-house



FIG 106  
CHINESE COOLIE PORTER  
WITH A LOAD OF BRICK  
TEA



FIG 107—CHINESE COOLIE  
IN RAIN COAT

Next, currents of hot air are driven through the trays by means of powerful fans, until the leaves turn black. They are then put into a gigantic sieve, where the large and small leaves are separated from each other. Many more siftings and sortings have to be done by hand, till at last a final drying is given to the tea, and it is taken to the packing house. Some of the tea is put into packets, but most of it is packed into tea chests—wooden boxes lined with thin lead-foil to keep them air-tight.

Tea chests must not be made of strong-smelling wood, or the flavour of the tea will be ruined, also, if the chests are not air-tight the long sea voyage which most of them have to undergo will spoil the tea.



In China, tea is often made into bricks for conveyance by pack animals to Tibet, Mongolia, and Russia, but this brick-tea is only made from inferior material

It was in China that the plant was first cultivated, and it was not until 1664 that tea made its first appearance in England—when the English East India Company made a present of a small quantity to the King of England

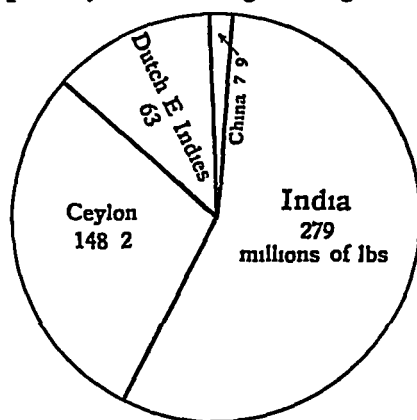


FIG 108 —SOURCES OF YEARLY BRITISH SUPPLY OF TEA IN MILLIONS OF LBS

As late as 1885 China supplied the bulk of the tea exports, but now, although that country has the largest production, India has the greatest export, and Ceylon is next in importance (See Fig 108) Britain imports more tea than any other country, so that London is the world's great tea market

The Chinese plant yields a comparatively weak tea, but the Indian and Ceylon teas are noted for their strength

It is the practice to blend teas

of different regions of Asia in order to obtain mixtures which combine the special qualities of several varieties

The Japanese are great tea-drinkers, and much tea is grown in Japan and her southern island possession, Formosa. Japan is the chief exporter of tea to China and U S A

Next to India and Ceylon, Natal is the most important tea-producing country of the British Empire

The famous **Paraguay tea**, or **yerba-maté**, is one of the most important economic products of S America. The yerba-maté is a plant belonging to the holly species, but the leaves are not prickly. It grows in tall bushes from twelve to twenty feet high. Large

leafy branches are cut from the shrub and placed on hurdles over a wood fire until sufficiently roasted. The dried branches are then laid on a hard floor, and the withered leaves are beaten with sticks, after which they are reduced to powder in rude mills. This powder is then ready for packing in skins and leather bags. The powder is put into a gourd or calabash, which serves as a teapot, and boiling water is poured on it, then it is sucked through a pipe or straw called a *bombilla*, Fig 109. Maté is refreshing and sustaining, and it helps to cool the body in the great heat. Maté is the universal drink in most parts of S America. The home of the plant is Paraguay, and yerba-mate is sometimes spoken of as Paraguay tea. Out in the wide cattle areas, jerked beef and maté are often the only things for the rancher to eat and drink for weeks together.



FIG 109  
MATÉ GOURD  
AND BOMBILLA

**Coffee.** The following figures give the production of coffee in thousands of cwts for one year in different parts of the world

COUNTRY	THOUSANDS OF CWTs	COUNTRY	THOUSANDS OF CWTs
Brazil - - -	30,000	Guatemala - - -	1,100
Colombia - - -	5,000	Salvador - - -	900
Venezuela - -	1,320	Mexico - - -	720
Dutch E Indies -	2,400	Haiti - - -	612

Notice, in the above table, the outstanding importance of Brazil for coffee production. Out of the eight areas mentioned, Brazil produces two-thirds of their total output. Notice, also, that seven out of the eight regions are in the continent of America.

Coffee consists of the seeds or beans of the coffee shrubs. These seeds, when picked, are enclosed in red berries, each of which usually contains two seeds. The shrubs, like tea, require a rich, well-

drained soil, and a warm, humid atmosphere. An abundant supply of cheap labour is necessary, since a large amount of handwork has to be performed in preparing the product for the market.

The original home of the plant was probably Abyssinia, and from thence it has been introduced into other parts of the world. The Dutch were the first traders in the product, and they are still the largest coffee drinkers. Jamaica produces the best coffee, known as "Blue Mountain" coffee.



FIG 110 —THE COFFEE PLANT

Brazil, which is so important in the production of coffee, has only become prominent during the last century. In the east of Brazil are the Brazilian Highlands, with many deep valleys separated by steep ridges called *serras*. One of the most important ridges is the *Serra do Mar* in the São Paulo district, which gets the full force of the South-east Trade Winds and is specially suited for coffee growing, as coffee grows best on well-watered

mountain slopes within the tropics. The average annual crop is 13 million sacks (1 sack = 132 lbs). The first railways in Brazil were constructed to bring coffee to the coast for export from Rio de Janeiro and Santos. (See Fig 111.)

A flourishing coffee *fazenda* has an attractive appearance. The strongly built house has a red-tiled roof, which stands boldly against the background of the hillsides covered with graceful shining coffee bushes. The leaves are dark green in colour, and the blossoms white and fragrant. Near by are groves of orange trees. The village is terraced below on the slopes of the *serra*, the low houses



**FIG 111 —SOUTH AMERICA.**

**Emery Walker Ltd sc.**

are distempered white, or pink, or green, like Devon cottages. The villagers live largely on black beans, which are often cooked with pork. Jerked beef and rice are also important articles of food. The fruit of the coffee plant, which begins to bear best when about ten years old, is like, and is called, a cherry. The yellow pulp contains two seeds, and, when ripe, the fruit is soaked in water till the fleshy part easily separates from the seeds. The seeds are taken out, dried, and passed through rollers to break the skin which holds the seeds together. After winnowing, the beans are put into bags for export, and later are roasted and ground into powder. The coffee industry of Brazil is mostly in the hands of Portuguese growers.

Rio de Janeiro, January River, was so called by the discoverer, who entered the harbour on the 1st January, 1502, and thought that he had found the mouth of a great river. Rio de Janeiro is the capital city of Brazil and its chief seaport, it has a population of over one million. The city is built on the shores of several fine bays and is surrounded by mountains. One of these is the Sugar-loaf, to the top of which runs a wire rope on which carriages are slung and are pulled up by a powerful motor. The houses are mostly built on terraces which rise from the bays, and are often surrounded by masses of greenery, trees, and tropical bushes. Rio de Janeiro is a modern sanitary city. It owes its importance as a port to the coffee industry.

Cocoa, or more correctly, Cacao, is a small tree, native of tropical America, but cultivated in many hot moist countries. It must not be confused with the coconut (sometimes written *cocoa-nut*), which is the fruit of a palm. (See p 204.) The scientific name of the cacao tree is *theobroma*, two Greek words meaning "Food for the gods." The flowers and fruits do not arise on young side branches, as on apple and pear trees, but they grow directly on the main trunk and the principal branches. The pods, about eight inches long, look very curious hanging as they do away from the leaves, Fig 112

These fruits are at first green, but turn red and yellow as they ripen, and when dried their colour becomes a chestnut-brown They look

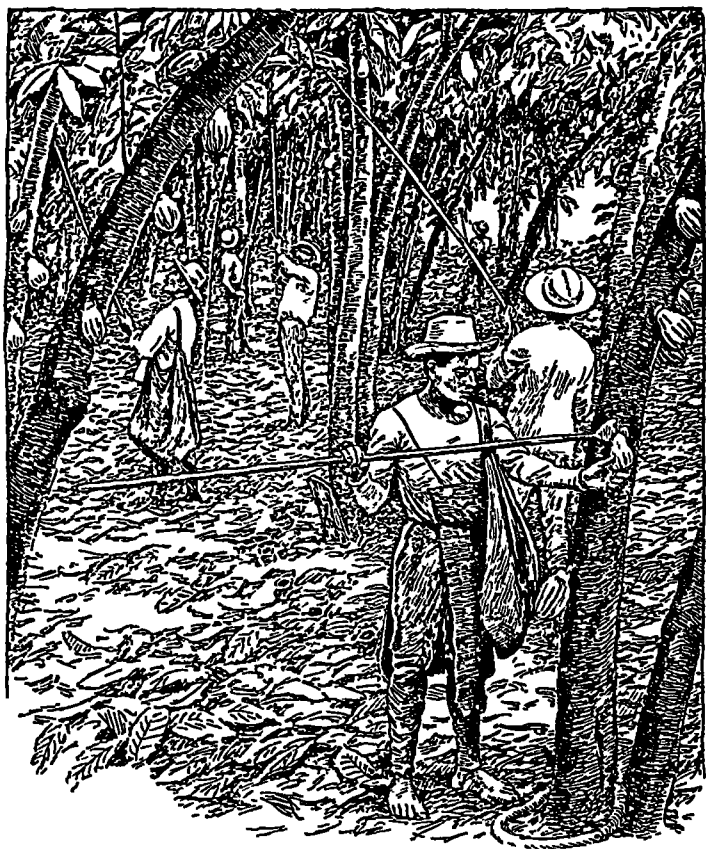


FIG 112 —GATHERING COCOA PODS

somewhat like very thick cucumbers in shape The rind of the pod is leathery Each pod contains from thirty to sixty seeds, white when fresh, but brown when dried Men pick or cut the pods with

a peculiar knife at the end of a long stick, and place them gently on the ground, women and children collect them into heaps with plantain or other green leaves, and then they are left a few days to ferment. "Breaking pods" is done with a cutlass. As a rule, the moist cocoa-beans, or nibs, are put into a sweating-house and laid on laths to allow the juice to escape. They are afterwards dried in the sun, or artificially by hot air. In order to polish the beans and help to remove any traces of pulp, they are often laid on a drying floor,

and many men are employed treading the produce with their naked feet. This is known as "dancing cocoa."

The cocoa is then ready to be shipped. Hamburg, Havre, London, and New York are the chief cocoa ports. About half the weight of a cocoa bean is fat, which, when extracted, is known as cocoa-butter.

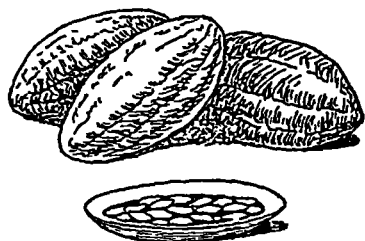


FIG 113—COCOA PODS AND NIBS

It is used in perfumes, cosmetics, and soft toilet soap. Chocolate is a mixture of cocoa with sugar, and as a rule with spices also. For the making of cocoa and chocolate, the beans have to be sorted, roasted, shelled, and ground. This work is carried on in large factories where cocoa and chocolate are made. When ground, the nibs produce a liquid because of the amount of fat in them, this liquid is poured into canvas bags and subjected to great hydraulic pressure, until nothing remains but the dry powder of commerce.

By far the largest producer of cocoa is the Gold Coast, which might now well be called the "Cocoa Coast." Other important producers are Brazil, Ecuador, Nigeria, the E. and W. Indies, and Venezuela.

Spain is the only European country where cocoa is regarded as a necessity. Switzerland and Holland import large quantities for making chocolate for export.

Sugar is obtained from two main sources, the cane and the beet. Notice on the map, Fig 103, that the production of cane-sugar is restricted to the hot regions of the world, notably Cuba, India, and Java. The cane is a plant which sends out new shoots each year. It requires a moist soil and fairly high temperature, and its cultivation is restricted to tropical islands, and hot coastlands having a yearly rainfall of over 60 inches. The plant requires little attention

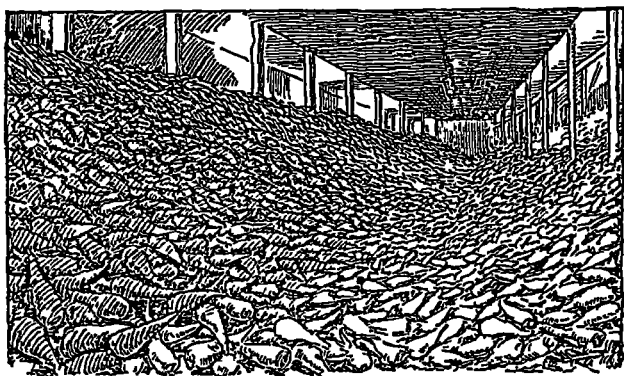


FIG 114—SUGAR BEET AT THE FACTORY

during its growth, but an abundance of cheap labour is necessary in harvesting the crop and preparing the materials for export.

The canes are crushed in mills, and the juice, which is extracted, is then boiled, after the addition of lime, to prevent fermentation. The resulting syrup is crystallised as raw sugar, the remaining liquid being known as molasses.

The **Sugar Beet**, discovered in 1774, has become one of Europe's most valuable crops. Beet sugar is exactly the same as cane sugar in composition, and it can be grown most successfully in *temperate latitudes*. Plenty of labour is needed in the cultivation of the beet and the production of sugar, hence it is grown in thickly populated areas such as Germany, U.S.A., Czechoslovakia, Poland, and N Italy.



The following table shows a year's imports of tea, coffee, cocoa, and sugar into Great Britain and Ireland and U S A

GREAT BRITAIN AND IRELAND		UNITED STATES	
Tea	504 million lbs	Tea	- 96½ million lbs
Coffee	7 million cwts	Coffee	- 14 million cwts
Cocoa	- 1½ million cwts	Cocoa	- 4½ million cwts
Sugar	- 45 million cwts	Sugar	- 90 million cwts

### Notes

**Brick-tea** consists of the broken leaves, stalks and fragments of large leaves compressed into blocks, which are sold to numerous tribes in Central Asia, who stew it with salt, milk, butter or other fat and eat it as a vegetable

**Beverage**, a drink, any agreeable liquor for drinking

**Terraced**, cut in raised level banks On the sloping sides of hills and mountains soil will not accumulate Terraces are cut to give a good depth of soil for the cultivation of plants such as tea and rice

**Peasants**, those whose occupation is tilling the soil

**Molasses**, a thick brownish yellow syrup that drains from sugar during the process of manufacture Rum is produced by fermenting molasses

**Maple sugar** is obtained from the sap of several American species of the maple tree, which are tapped just before the spring when the sap is rising

### Exercises

1 Name all the countries shown in Fig 103, where tea, cane sugar, and beet-sugar are produced respectively

2 Give the route by which (a) China tea is brought to England, (b) Japan tea is sent to America

3 State the situation of Rio de Janeiro, Ecuador, Cuba, Jamaica, Tibet, Formosa, Salvador

4 Name the countries which produce each of the following in the largest quantities tea, cane sugar, beet sugar, coffee, cocoa

5 Write short notes on (a) cocoa ribs, (b) coconuts

6 Write a brief summary of the tea or coffee industry

7 Explain the diagrams, Figs 104 and 108

8 Where in the British Empire are tea, cocoa, cane sugar, respectively grown?

9 Explain the following Paraguay tea, "Food for the gods", cocoa butter, "cocoa Coast", spices, coffee cherry

10 Explain the illustrations, Figs 105, 112, and 114

11 What do you understand by the monsoon region of Asia? Name some important productions of this region

12 Draw a map showing the route by which sugar is brought from Callao to London

## CHAPTER XV

### FOREST PRODUCTS

THERE are two great forest belts on the earth—the **Temperate Forest** and the **Tropical Forest**. These are shown on Fig 115, and it is seen that the temperate forest encircles the world in the cool part of the temperate zone, being broken only by water and high mountains, while the tropical forest is found in lowland areas near the equator. The forests of Asia, N America, Europe, and Australasia are mainly of the temperate variety, while those of S America and Africa are chiefly tropical.

The chief forest product is **timber**, and this is needed in every industry. A tremendous amount is used in the building trade, in the manufacture of furniture, in the manufacture of packing-cases, boxes and barrels, for paving roads, as pit-props in the mining industry, and in many other ways.

Other forest products are obtained from the **saps** of trees and include rubber, gutta-percha, turpentine, and resin. Many **medicinal products** are derived from trees of the forest, and these include castor oil, quinine, and oil of eucalyptus. From logwood, camwood, fustic, etc are obtained valuable **dyes**. **Wood pulp**, used in the manufacture of paper, is also an important product of the forests.

**The Temperate Forest.** The temperate forest contains *hard* and *soft* woods. The pine is the most important *soft* wood timber, and

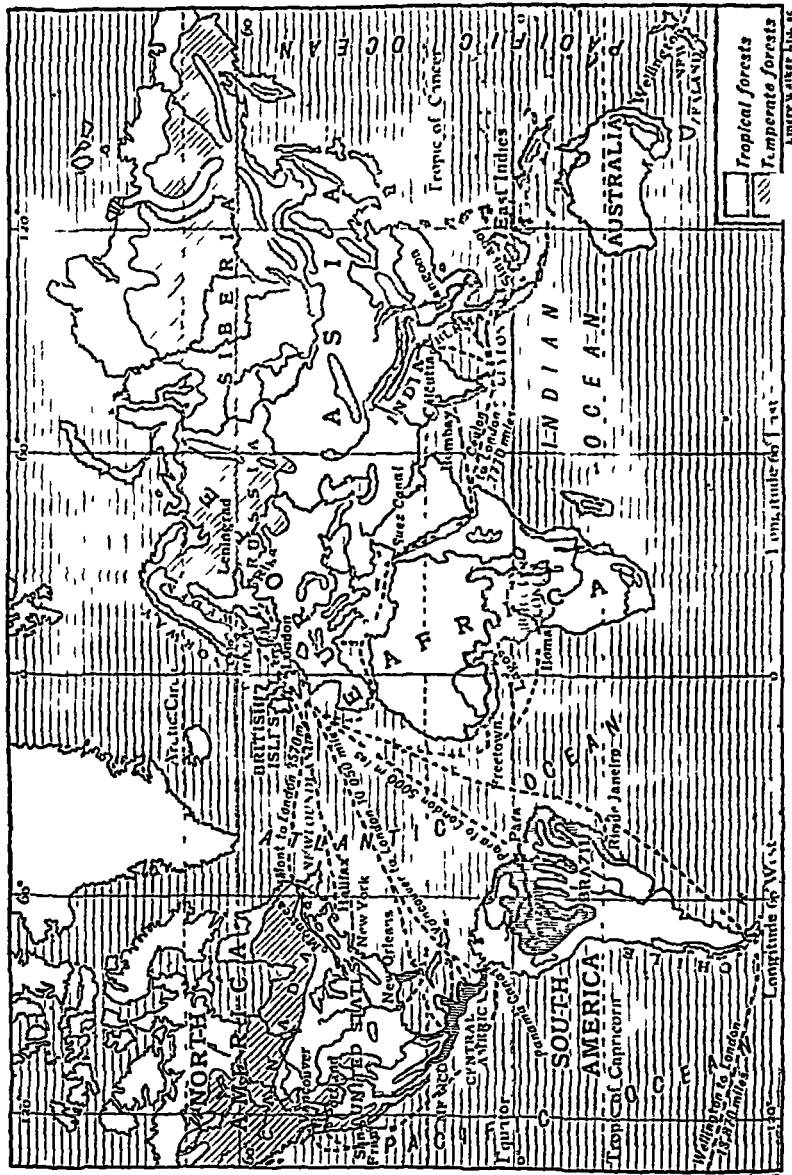


FIG 116.—TROPICAL AND TEMPERATE FORESTS

is the chief timber of commerce. It is obtained mainly from the forests of Eastern Canada, Norway, and Sweden, and the Bordeaux district of France, but important pine wood is also cut in the east of the United States, in Tasmania, and in New Zealand. The value of pine lies in its being easily worked, and in its strength, which is due to the straightness of its grain. It is used for the masts and decks of ships, for the manufacture of the wooden parts of houses, for the making of packing-cases and boxes, and in the manufacture of matches.

The chief *hard* woods are oak, ash, elm, and beech, and they are obtained from the southern part of the temperate forest. Oak and beech are often used in the manufacture of furniture, the latter being specially adapted to the making of chairs. High Wycombe, in England, has become noted for chairs, because it is situated near a beech forest from which it can draw its supplies of timber. Ash is used for the manufacture of handles of hammers, axes, cricket bats, etc.

The cutting down of trees, or *lumbering*, is a highly important industry in Canada. Most of the work of gathering the timber is done in winter, when the logs can be readily moved on the frozen snow to the rivers, there to wait for the thaw, when the logs are floated to the sawmills of Quebec and other places. The mills are driven by water-power or electric-power.

Quebec leads the Canadian provinces in the production of pulp-wood, used in paper-making. Several London newspapers have their own pulping and paper-making plant in Newfoundland and parts of Canada. Ontario is first in *value* of products in the lumber industry. The chief centre is **Ottawa**, the capital of the Dominion. Water power for the sawmills is obtained from the Chaudière Falls, which also generate electricity with which the city is lighted.

The hunting and trapping of fur-bearing animals takes place during summer in the cold forests. In early days of colonisation the noted Hudson Bay Company founded *stations*, e.g. Churchill and

Port Nelson, to carry on trade in skins with the trappers, who, at that time, were native American Indians To-day, both Canadians and natives are engaged in the collection of furs

In the forests of Siberia there is at present a lack of routes and means of transport, so that little lumbering is carried on, and trapping is the chief industry



FIG 110—COLLECTING TURPENTINE FROM PINES IN GEORGIA, U S A

Forests of coniferous trees are also found on mountain slopes such as the Alps and Himalayas, where, owing to the elevation, the climate is cold There is an important lumbering industry in Georgia (south-east U S A ), where pines grow on the poor soil of the coastal plain Tar, turpentine, and resin are exported in large quantities from Savannah in Georgia

Norway and Sweden have important lumber industries mainly because of the cheap hydro-electric power which is developed from

the waterfalls Millions of pit-props, used for holding up the roof and sides of the coal-mining galleries, are sent to the mining centres of England from these forests Beside pit-props, there are exports of ready-made doors and window frames, railway sleepers, packing-cases, matches, wood pulp, turpentine, and pitch So well and quickly is the work done in the mills, that a tree standing in the morning may be a roll of paper in the evening

The following table shows the value of the chief exports from Norway and Sweden to the United Kingdom for a year

NORWAY—MILLIONS OF £ S		SWEDEN—MILLIONS OF £ S	
Timber -	2	Timber -	5 3
Paper	1 3	Wood pulp -	3 1
Wood pulp	1 4	Paper	2 3
Fish -	1 4	Iron -	1 2
Metals	6	Matches	2

Britain's largest supplies of pit-props come from France and Finland

The Tropical Forests stretch along the equator for about 10° north and south of it The three great regions are the forests of the Amazon, known as *Selvas*, in S America, the forests of the Congo Basin and the Upper Guinea coastlands of Africa, and the forests of the E Indies (See Fig 115) In these vast forest regions the heat is always great, and rain is abundant the whole year round

The tropical forests contain cabinet timbers and dye woods The chief woods used for making the best furniture are mahogany, ebony, cedar, and rosewood Their superiority lies in their beautiful appearance when polished Central America and the W Indies are the main source of these timbers, but they abound in the valleys of the Amazon and Congo These river valleys are, however, very unhealthy, and lumbering is not an important industry The chief

dye-woods are logwood and fustic. The former gives a rich red, and the latter a yellow dye, much used in making Khaki colour.

The best quality mahogany is obtained from Haiti, and inferior sorts come from Cuba, Jamaica, and Mexico.

The hardest, blackest and most valuable ebony is obtained from India, but some is derived from Africa.



FIG 117—ELEPHANT PILING TEAK IN INDIA

Teak is of the highest value for shipbuilding, it is as hard and durable as oak, and it contains an oil which preserves iron by preventing rust. Teak is the chief timber of India and Siam.

The Selvas are forest-covered lowlands annually fertilised by silt brought by the flood water of the Amazon. The abundant rainfall and tropical heat are exactly suited to the growth of dense forests. Here every plant grows in wild profusion. Thick creepers loop the tall trees together, and make with the tree tops a perpetual dusk below. Birds of brilliant plumage—parrots, humming birds,

toucans—butterflies and beetles of vivid colour flit and flutter near the soil. Monkeys chatter higher up, tree-snakes, huge ants, venomous spiders and poisonous insects, put the traveller's life in peril. The air is heavy, damp, and weakening. An abundance of animal life haunts the rivers and forests. Alligators, eel-like lung fish, huge water-snakes, great sloths, tapirs, jaguars, and birds of prey are met with on land or in the water. There are, however, no animals like the elephant, lion, tiger, rhinoceros, and giraffe, which are found in other parts of the world.

Tribes of uncivilised Indians, stunted in growth and dwarfed in intellect, live in huts of reeds, grass, mud, and leaves. They sometimes cultivate small patches of rice and manioc, but fish, and fruit like oranges, mangoes, and bananas, are to be had in abundance, the milk tree gives delicious milk, the Brazil nuts, contained in hard shells as big as a man's head, supply oily, nutritious food, from a rough kind of cotton the Indians weave loin-cloths and hammocks. The white man has, so far, only penetrated to the edges of the forests mainly for rubber.

**Rubber.** About one-half of the world's supply of rubber comes from Brazil. Rubber is the congealed juice or latex got from certain trees, shrubs, and vines. In the Amazon valley are enormous forests of trees which produce the famous Para rubber. The latex, or "milk," is drawn from the tree by making cuts in the bark with a strong knife or an axe, in the deep cuts small basins with a tube at one end are inserted. The basins are regularly collected, and the milk is thickened into rubber in the smoke from a fire of palm nuts.

The tapping of rubber trees in Brazil is a most unhealthy and dangerous job. The tapper must settle down in the heart of the forest for a long period. He may be attacked by wild animals, or get diseases through insects or the damp heat. Jaguars, boa constrictors, huge vultures, horrid blood-sucking vampire bats, venomous ants, and a thousand poisonous insects are all foes of



the tapper, who collects the juice which is of such service to the modern world

The men who work in the forests are mostly Indians. Often they live together in camps over which there is a superintendent, but much rubber is collected by independent individuals who carry the

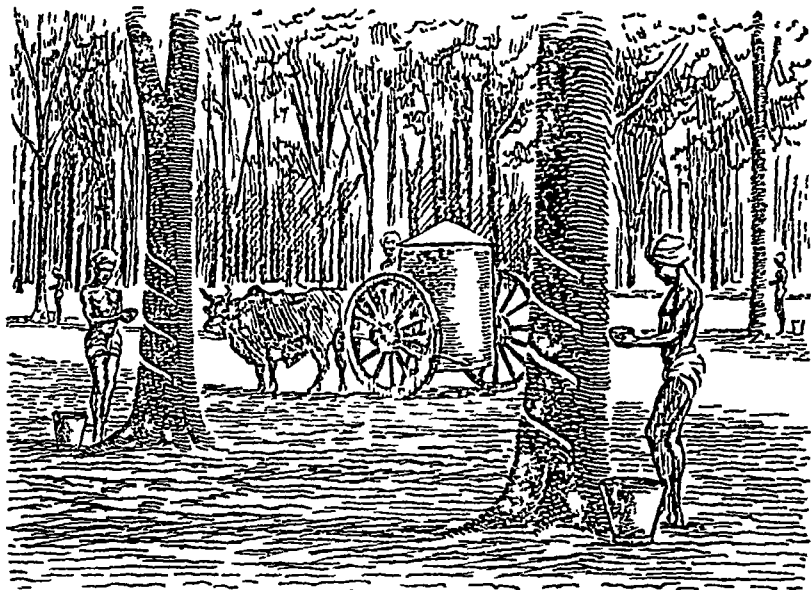


FIG 118—COLLECTING RUBBER

hardened raw rubber, called *hams*, by canoe to the nearest camp for sale. Para near the mouth of the Amazon, and Manaos, 1000 miles up the river, are the great rubber ports

Seeds of the trees giving Para rubber have been used to cultivate rubber plants in Burma, Ceylon, the Malay States and the E Indies

The forests of the Congo Basin are in many respects similar to the S American Selvas. The principal exports are rubber, ivory, palm oil, and palm nuts

**The Upper Guinea Coast** The hot, moist, equable climate of the Upper Guinea coast is deadly to white men on account of the dangers of malarial and yellow fever, and the absence of a pure water supply, and of modern methods of sanitation. In some towns much has been done within recent years to control the diseases and modernise the towns. The characteristic tree is the oil palm, the fruit of which supplies palm oil, an important article of export. The india-rubber creeper grows wild in the forests, close to the sea grows the coconut palm. In the clearings the natives cultivate such tropical products as cotton, indigo, cocoa, tobacco, cassava, yams, maize, rice, and sorghum, etc.

The oil palm tree, a native of W Africa, grows to a height of about 30 feet. It has a stout stem bearing at its extremity a crown of magnificent feather-like leaves, some fifteen feet long. On each tree there are six or eight bunches of fruits. The fruits have a fleshy and fibrous outer layer of a bright orange-yellow or orange-red colour.

To collect the fruits, the natives climb the tall trees and cut off the fruit heads. When they are put into pots and boiled, the fruits separate from the heads. The oily mass is run into a wooden trough and, when cool, the natives pound out the oil by treading it with their feet. The oil which rises to the surface is skimmed off by women, who pass it through a sieve to remove impurities. Palm kernel oil is more valuable than palm oil.

The nuts of the fruit are cracked between stones by women and children. The palm kernels are mostly exported, and the oil from them is expressed by powerful pressing machines. Many thousands



FIG 119 —OIL PALM

of pounds' worth of palm oil and palm kernels are exported annually from West Africa. Important centres of the trade are **Freetown** the capital of Sierra Leone and **Sherbro Island** off the coast, and **Lagos** the chief port of Nigeria. Natives carry baskets of palm kernels on their heads from the forests to the streams, they then take the kernels in their canoes to the coast, and there exchange them with traders for various manufactured articles. Sometimes the kernels are taken to the factories scattered along the coasts at the river mouths. Palm oil is mainly used in the manufacture of soap and candles although the natives greatly enjoy it with their food. The white palm kernel oil, which has a nutty flavour, is also used in the making of margarine.

**The East Indies** The heat in the equatorial forests of the East Indies, Ceylon, and the Malay peninsula is tempered by the sea breezes, and, in addition, these lands are mountainous. Being easy of access to the sea there are British, Dutch, and American plantations of rubber, coconuts, sugar, and spices. The Moluccas are the famous Spice Islands which attracted the explorers of the 15th and 16th centuries, for spices were highly valued to make the salted meat of those days more palatable. We have already noticed the importance of the plantations of coconuts, rice, tea and sugar, and the tin mines of this region. The splendid sites of the ports of Colombo and Singapore on this commercial highway to the East have been referred to in several places.

### Notes.

**Wood pulp** is now the chief material used in the manufacture of paper. It is made by grinding down the wood-fibre of pines and spruces, or by chemical action on the wood fibre. The manufacture is carried on where there is an abundance of raw material and a plentiful supply of water.

**Turpentine and Resin** Resin is used in the manufacture of soap, printing inks, sealing wax, etc. It exudes in a liquid state from the stems and branches of pines, and is sometimes found in the solid state in the ground near

where the trees grow Spirit of turpentine is obtained by distillation from resin The main source of supply is the U S A

**Kauri Gum** is the resin of the New Zealand pine It is dug in large lumps out of the earth where forests of the tree formerly existed It is the finest resin for the manufacture of varnishes

**Amber** is the solid resin from pines of former ages It is used in the manufacture of ornaments and for making varnish It is principally obtained on the Baltic coast of Germany

**Dragon's blood** is a red resin used for colouring varnishes and in making wood polishes

**Camphor** is obtained from a laurel which grows in the island of Formosa

**Tannin** is obtained from the bark of many trees, and is used in tanning hides and skins in the manufacture of leather Oak bark is the best for tanning, but the chief tanning extract in use is Quebracho, which is obtained from a native tree of tropical S America

**Castor oil** is extracted from the seeds of a tropical shrub, and is used for soap making as well as in medicine India is the chief source of supply

**Gutta-percha**, like rubber, is the hardened sap of a tropical tree, and is obtained mainly from the East Indies To obtain the sap the trees are felled, and thus destroyed as a source of supply Gutta-percha is used for many of the same purposes as rubber, but the chief use is for insulating telegraph cables

**Cinchona**, or Peruvian bark, came originally from Peru, but is now obtained largely from Colombia It is also exported from Java and India The bark is used for the extraction of quinine, a great remedy for malarial fevers prevalent in tropical climates

**Oil of eucalyptus**, which has important medicinal properties, is obtained from the eucalyptus or blue gum tree of Australia

## Exercises

- 1 Name the countries in which there are (a) great temperate forests, (b) great tropical forests
- 2 What are the characteristic features of (a) great temperate forests, (b) great tropical forests?
- 3 Explain the following Trappers, Hudson Bay Company, pit props, wood pulp, latex
- 4 Name some important forest products
- 5 What do you know of the chief industries of Norway and Sweden? How are the industries influenced by geographical conditions?

6 State the situation and importance of Ottawa, Para, Churchill, Manaos, Sherbro Island, Spice Islands

7 State the sources and uses of rubber

8 Where in Africa is human portage necessary? Give reasons

9 Write a summary of the palm oil industry

10 What do you know of lumbering?

11 Why is there less lumbering in Siberia than in Canada? For what industry is Siberia noted?

12 Explain the map, Fig 115

## CHAPTER XVI

### FRUITS, WINES, AND TOBACCO

FRUITS are grown in most parts of the world other than the extremely cold regions. The list of fruits is a very long one, but we are so familiar with the fruits that it is not necessary to say very much about them in this book. Many fruits are grown in England, but as England has only one harvest in a year it is necessary to import considerable quantities from other countries. So effectively is this done that we now have ripe fruit in England all the year round. Fruits can be classified as those of the cool temperate zone, the warm temperate zone, and the tropics.

**Cool temperate zone** The climate of England is typical of this zone. The most important fruits grown are the apple, pear, cherry, and plum, and the chief orchard counties are Kent, Surrey, Hereford, and Devon. Many parts of the continent of Europe, Canada, U S A, Australia and S Africa also belong to the cool temperate zone, hence fruits of the same kind are produced in large quantities. Where the summers are a little warmer than those in England, peaches and apricots must be added to the list.

**Warm temperate zone** The Mediterranean area has the typical climate of the warm temperate zone. The climate is distinguished

by warm summers, mild winters, and winter rains. The European countries bordering the Mediterranean—Spain, France, Italy, Greece,—all produce fruit in abundance. This fruit is mostly distinguished by its thick rind, often containing some kind of oil which prevents rapid evaporation of moisture during periods of dryness. The fruits of this region are the well-known citrus fruits—oranges and lemons—olives, figs, nuts, and grapes. Other parts of the world having a typical Mediterranean climate and producing some of the same fruits in large quantities are **California** on the Pacific coast of U S A , the south-west of **Cape Province**, the State of **Victoria** in Australia, and the district about **Mendoza** in **Argentina**. In these areas it is necessary to provide water for the plants by artificial means, and extensive irrigation works have been constructed.

**The Tropics** There is, of course, no marked division between the zones, the one gradually merging into the other, so that the fruits which are distinguished as belonging to the Mediterranean area, for instance, also grow in the sub-tropical area. Tropical fruits are those which can thrive in a burning sun. The various palms are typical plants, they have long roots which penetrate deeply for moisture, and few leaves so that little moisture is lost by evaporation. Noted palms are the date palm, coconut palm, and oil palm. Other important tropical fruits are bananas, bread-fruits, and mangoes, pineapples, melons, and the citrus fruits—limes and grape-fruit. Of these fruits, the mango and bread-fruit are not largely exported. Palm oil and palm kernel oil were noted in the last chapter.

The following notes on some of the fruits may be useful for reference.

The **Banana** is a gigantic perennial herb cultivated in most tropical and sub-tropical climates. The stem is short, and what appears to be a trunk is formed of the bases of enormous leaves, eight to ten feet long and one foot wide, used by natives for thatching. In the tropics, the banana is as important to the natives as are the

grain crops to those who live in cooler regions **Banana-meal** is an important foodstuff. Enormous quantities of bananas are exported to England from the W Indies, especially Jamaica, and from Colombia, and the Canary Islands

The **Orange** is the fruit of an evergreen tree that is grown in many warm countries The white, wax-like orange blossoms are of delightful fragrance, and are the bride's favourite flower The dark polished



FIG 120 —BANANA TREES WITH FRUIT IN JAMAICA

leaves are very beautiful An orange grove, or orchard, is so fragrant that one can smell it half-a-mile away, and humming birds and bees come to it by the thousand The trees are planted in regular rows like apple trees in an English orchard, they need a good deal of care, and must be sprayed and fumigated often to destroy the various pests that feed upon them Frost does much harm to the crops When there is any danger of frost, fires are lighted throughout the orchard The fires of petroleum are built in small wire baskets or pots, and produce a dense warm blanket of smoke which keeps the temperature above freezing-point The oranges are cut

with scissors, the pickers wear gloves so as not to scratch the skin of the fruit. At the packing-house the oranges are carefully sorted and graded in size, wrapped in tissue paper, and packed in boxes so close that they cannot move. About 100 oranges of the largest grade, and about 200 of the smallest, fill a box. One of the most favoured kind brought to this country is the seedless variety from

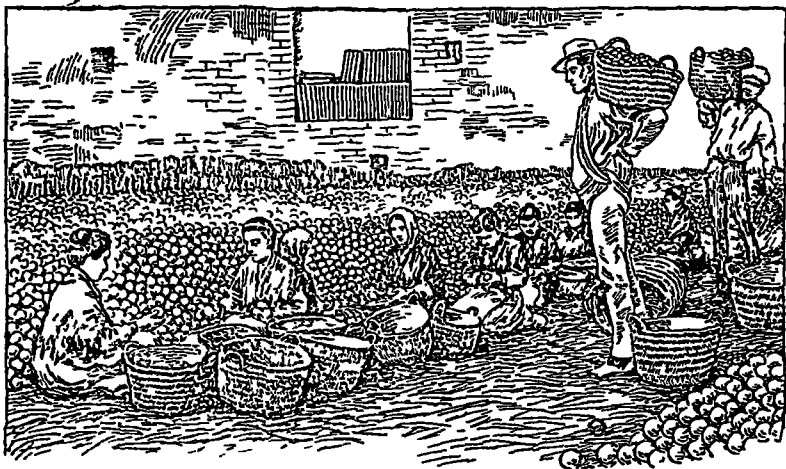


FIG 121 —SELECTING AND SORTING ORANGES AT THE DOCKS, VALENCIA

California. It has a curious, tiny, wrinkled orange no bigger than a cherry tucked into the blossom end.

The Lemon is the fruit of a small evergreen tree that is grown in warm countries. The plant has oblong leaves and fragrant purplish flowers. The lemons are picked green. Each picker has a ring  $2\frac{1}{4}$  inches in diameter, and the fruit is cut when it can just slip through the ring. The lemons slowly ripen in dark storehouses, they are then washed, dried, and wrapped in tissue paper. Lemon oil is extracted from the peel, and citric acid from the pulp. For making candied peel the fruit is cut in two, the pulp cleaned out,



and the peel soaked in several baths of sugary syrup The lemon tree is exceedingly fruitful, a large one in Spain producing as many as three thousand fruits in favourable seasons

The Olive is a small evergreen tree, a native of the Mediterranean-region The fruit is a plum, from the fleshy part of which olive oil is expressed Pickled olives have had their natural bitterness reduced by soaking in a solution of lime and wood-ashes, after which they are bottled in salt and water In Southern Europe olive oil is largely used in cookery, to a great extent taking the place of butter

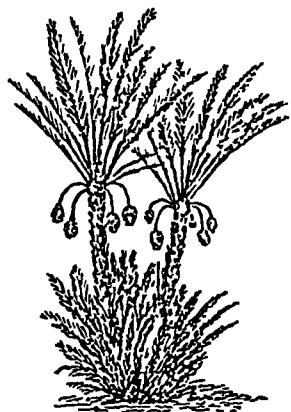


FIG 122 —DATE PALM

The Date Palm is the principal tree of the oases, without it human life would hardly be possible In Tunisia is a region called *The Land of the Palms*, where the date palm is found at its best An old Arab proverb says "The date palm, the queen of trees, must have her feet in running water and her head in the burning sun" Some palms continue to bear fruit for 100 years The average yield is from 100 to 200 pounds yearly The dates grow in large bunches

weighing 10 to 30 pounds each In October the pickers climb the scaly trees, clinging to the bark with bare toes, the bunch is cut off with a heavy knife, the blade of which has a saw-like edge The fruit is handed to a man clinging to the tree below, and he in turn hands it to another man, and so on, until the fruit, sound and unbruised, reaches the ground The best fruit, with the dates still clinging to the branch, is placed in boxes and shipped directly to Europe The date is a staple food of many people in N Africa, Persia, 'Iraq, Oman, Syria, and Egypt Tafillet in Morocco supplies the best dates, and Basra ('Iraq) exports the largest quantities

The Pineapple is a herb from the rootstock of which grows a cluster of long, thin, sword-shaped leaves with sharp-toothed edges. From the centre of the cluster rises a short, stout stem ending in a spike of flowers. The flowers grow together into a juicy compound mass which is called the fruit, but it is really the fleshy flower stalk. The large, fully ripe pineapple that comes from abroad is picked



FIG 123 —PINEAPPLE FIELD IN S AFRICA

green, and grows mellow in this country. Our chief supplies come from the Azores and the Canary Islands, the W Indies supply U S A. Large numbers are tinned, and in this form are best known in England. The pineapple gets its name from its resemblance to certain kinds of fir cones.

Brazil Nuts are the seed of a very tall tree which is grown in the tropical forests of the Amazon basin. Its oblong leaves are six feet in length, about twenty nuts are contained in a hard fruit as large as a man's head.

Grape-fruit, Shaddock, or Pomelo, is an evergreen tree, with downy shoots and oval leaves. It has white flowers and pale yellow, thick-skinned fruits which weigh up to 11 lbs. The import of grape-fruit is steadily increasing in England, for its acid juice is very refreshing. The chief supplies come from the W. Indies and Florida where it grows abundantly.

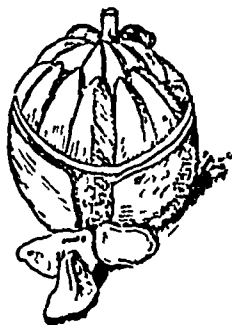


FIG 124—BRAZIL NUT

The Coconut is the large nut of the coco-palm, which grows in almost all parts of the tropics *near the sea*. Although the tree grows wild millions of acres are planted with the coco-palm in Ceylon and other warm moist

regions for commercial purposes.

The coconut palm is one of the most useful trees in the world, for practically every part of it is of service to the natives or for export. The kernel of the young nut is an important native food, and the "milk" is nourishing. The fibrous husk of some varieties of nut is made into coir, which is spun into matting and ropes and used for stuffing upholstery, etc. The dried kernel is exported as copra, the oil of which is now used chiefly in margarine, also for the manufacture of soap and candles. The kernel is also used as desiccated coconut in confectionery. An intoxicating drink called toddy is extracted by



FIG 125—NATIVE DRAWING TODDY FROM THE COCONUT PALM

the natives from the sap of the flower-head, and from toddy a potent spirit called arrack is distilled. The leaves and wood of the tree are of great use to the natives for house-building. British supplies of coir are mainly imported from Ceylon and India.

Grapes are exported as a fruit from the districts where they will not make good wine. France imports a large quantity from Algeria, N American supplies of table grapes are obtained from the vicinity of the Great Lakes, S American grapes are grown in the irrigated Mendoza area, England imports grapes mainly from Portugal, Spain, Germany, and S Africa.

The trade in dried grapes is much more important than that in table grapes. Raisins are prepared from grapes grown in the hotter and drier Mediterranean regions by cutting the stalks of the bunches half through, and leaving the grapes to dry on the vines. The best Spanish raisins are *muscatels* and *valencias*. Asia Minor, California, Cape Province, and Australia are other large exporters of raisins.

Sultanas are dried seedless grapes dipped in a solution of olive oil, potash, and vanilla. These are mostly produced in the Aegean Islands and Smyrna.

Currants, dried small grapes usually seedless, will grow only in the Ionian Islands, on the western side of the Morea, and a few other places in Greece. One-third of the value of Greek exports is in currants. The name is derived from the Greek town of Corinth.

Wine is fermented grape juice, but wine cannot always be made where the grape-vine grows. In countries with a Mediterranean climate the summers are dry and sunny, and extend into September. Such a climate is necessary for the production of wine. The grape-vine has a long tap-root, which enables it to draw water from great depths during the summer drought, and the depth to which the root penetrates enables it to resist frost. The grape vine is usually cultivated on the sheltered slopes of south-facing hills, where the drainage is good.

France leads all other countries in the production of wine, other important producers are Italy, Spain, Germany, Algeria, Cape Province, Victoria, Argentina, and Uruguay. The chief sources of British supply are Portugal, Spain, France, and Australia.

Certain districts and towns have given their names to well-known

brands of wine, *e.g.* Champagne, Burgundy, Bordeaux (called claret in England), Chablis, Beaune, Oporto (port), Malaga, Jerez (sherry).

**Tobacco** Tobacco is cultivated in both temperate and tropical parts of the world. It cannot be grown in areas which at any period of the year are subject to severe frost. The largest area for tobacco cultivation is in the U.S.A., in a belt extending from Chesapeake Bay to St. Louis, on the Mississippi, it includes the States of Virginia, Kentucky, and Tennessee (See



FIG 126—THE TOBACCO PLANT

Fig 87) Richmond, in Virginia, is one of the largest tobacco markets in the world.

The north-west corner of Cuba, near the town of Havana, is a famous tobacco area, the tobacco leaves being made into Havana cigars. Leaves suitable for cigars are also produced in the E. Indies—Sumatra, Java, and Borneo—where the finest cigar wrapper is grown. Manila cheroots and high-grade leaf are exported from

Luzon Is in the Philippines Turkey, Egypt, and Brazil also export tobacco By far the largest supply of British tobacco comes from U S A Many countries grow tobacco for home use Bristol, in the west of England, has large tobacco factories , its port is Avonmouth

### Notes.

Mango is an evergreen tree, a native of the E Indies The kidney shaped fruits of three to six inches in length and nearly half as broad grow in bunches The skin is green and tough, the delicately flavoured pulp is yellow Mangoes are largely consumed in India and the E Indies, some are made into chutney and preserves

Bread-fruit, the fruit of a pine tree, is a native of the South Sea Islands and E Indies The fruit, as large as a melon, is filled with a starchy pulp which, when roasted, is bread like, but flavourless It forms one of the staple native foods in the parts where it grows

### Exercises.

1 In a plum pudding none of the ingredients was produced in the British Isles State a probable source of each ingredient flour, suet, currants, raisins, sultanas, candied peel, sherry, spice, sugar, ground almonds, lemon juice

2 State the probable source of the ingredients in a box of confectionery containing sugared almonds, coconut chips, chocolate creams, marzipan dates, butter brazils, orange slices

3 What do you understand by a Mediterranean climate? Name some of the chief products of the Mediterranean lands

4 Explain the positions of three important fruit-growing centres outside Europe

5 State the positions of the following places Hereford, Asia Minor, Mendoza, Azores, Basra, Florida, Oporto, Virginia, Havana, Manila

6 Give three routes by which tinned apricots could be brought to England from California?

7 Explain the following irrigation, citrus fruits, coconut oil, cold storage

8 Explain with examples what you understand by *staple food*

## CHAPTER XVII

## THE TEXTILE INDUSTRIES

**Raw Material.** A manufacturing country needs raw material (cotton, wool, etc.), fuel (usually coal or oil), machinery, human labour, and good routes. Raw material and fuel are not generally supplied together by nature in the spots where they are required, but must be accumulated by man's efforts.

The easiest way to obtain raw material is to establish the manufacture where the raw material is found, but this plan is not usually adopted, and mostly it is not possible. For instance, Lancashire is the world's great cotton spinning area, but cotton cannot be grown in England. Dundee is noted for jute manufacture, but nearly all the jute in the world is grown in India. England produces very little of the raw material used in its factories, and this is usually the case in manufacturing areas in other parts of the world.

Much of the raw material is produced in the hot lands of the world, and such lands are unsuitable for factory work. The manufacturing industry is best carried on in the cool parts of the temperate zone, such as the British Isles, Germany, Belgium, and U.S.A., and those parts must obtain their raw material from the rest of the world.

**Human Labour.** Each industry needs labour with special skill. The cotton-spinner would be a bad shipbuilder, and the shipbuilder would be a poor shoe-maker. Unless an industry has skilled workmen it cannot be successful. Skill is the outcome of special training, long experience, and good management. It is therefore essential that each industrial area should be so managed as to have the necessary number of experienced workmen at its command. Hence we find that certain industries have been established in particular centres for generations. The woollen industry of Yorkshire,

for instance, is still carried on in the same districts in which it was started four centuries ago and, naturally, the woollen cloth weavers of Yorkshire are highly skilled men

The manufacturing industry needs a wonderful variety of raw material, which is fashioned into an extraordinary number of different types of articles. Each branch of the industry must be placed where the conditions are best suited for success, and in each industry towns will specialise in a particular branch of the work. Thus, the Staffordshire coalfield is noted for its ironwork, and here we find that Cradley Heath specialises in chains, Walsall and Dudley smelt iron, Redditch manufactures needles and pins, Coventry makes motor-cars and cycles, and so on. Again, in Yorkshire, carpets are made at Halifax, flannel at Rochdale, blankets at Dewsbury, shoddy at Batley, plush and velvet at Bradford, and broadcloth at Leeds.

The raw material manufactured in any area is drawn from many parts of the world, and the finished products are distributed to many lands. The collection and distribution depend upon routes (Routes have already been dealt with in Chapter VI, *fuel* and *machinery* will be considered in the next chapter.)

### THE COTTON INDUSTRY

Cotton is the most important material used for man's clothing throughout the world. In practically every household of the white race are numerous articles made of cotton—handkerchiefs, stockings, tablecloths, towels, sheets, blinds, flannelette, and a host of other articles. In hot countries such as India, China, and Egypt, nearly the whole of the native garments are made of cotton, and even in the less civilised countries the simple loin-cloth is often made of cotton.

Cotton fibre is prepared from the *lint* which covers the seeds of the cotton-shrub. The shrub is closely related to the English holly-hock. There are various kinds in different countries, but it is



generally a bushy plant growing about 3 ft to 6 ft high. The shrub is usually grown as an annual, it is very sensitive to frost and can only be grown successfully where there is no frost for six months of the year, and no rain after the calyx or *boll* of the flower opens. In dry regions the crop must be irrigated, and heavy manuring and much labour are needed to bring the plant to perfection. The



FIG 127 —COTTON PLANT

flowers may be red, golden-yellow, or a creamy shade according to the variety. When the boll bursts, and the white downy lint appears, the bolls are picked by hand, although cotton picking machines have been introduced, and may some day enable the crop to be gathered at a cheaper rate than is now possible by hand labour.

The lint is removed from the seeds by a machine called a *gin*, it is then packed in bales under great pressure ready for transport to the world's great cotton factories.

On the map, Fig 93, are shown the chief countries of the world for the production of raw cotton. The areas in U S A, Egypt, and in most of China and Japan are in the sub-tropics, those of India, the E Indies, and other parts are mainly in the tropics. The diagram of the four chief producers, Fig 128, shows a year's production in millions of cwts.

America grows nearly 50 per cent of the world's commercial crop. Study Fig 129, which shows the region of U S A which produces the best quality and the largest quantity of cotton. It stretches in one big belt from N Carolina to Texas, and the cotton is mainly shipped from the ports of Galveston, New Orleans, and Savannah. The cotton from U S A consists of two main varieties, long and short

staple—that is long or short fibres The best long staple variety comes from the islands off the coast of Georgia, and is called *Sea*

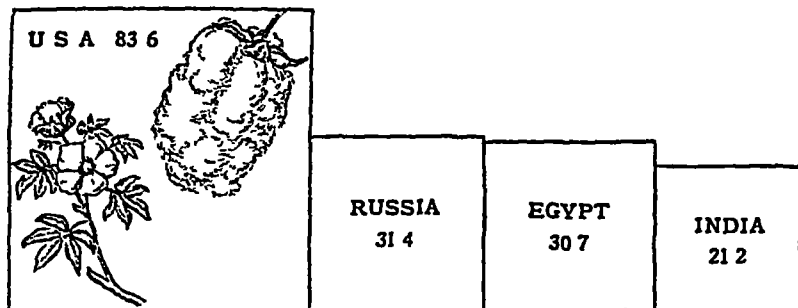


FIG 128—THE WORLD'S CHIEF COTTON PRODUCERS  
A year's crop in millions of cwt.



FIG 129—THE COTTON BELT OF U.S.A

*Island cotton* It is the best the world produces The short staple kind of the mainland is known as *Upland cotton*

Indian cotton is mainly produced on the fertile volcanic black lands of the Deccan and on the Ganges plain. Bombay is the chief cotton port. Indian cottons are coarse and short-stapled, and are unsuitable for the cotton factories of England. Much of this cotton is now used in the Indian factories of Bombay, Lucknow, and Cawnpore, the rest being exported to Japan, China, and the Continent.

Egyptian cottons are most valuable because they *mercerise* and dye well, being smooth and strong. They are valuable in the manu-

facture of tyre covers. Egyptian cotton is grown in the Nile Valley and Delta, and is exported from Alexandria.

Brazilian cotton is grown on the coastal lowlands, it is exported from Bahia and Pernambuco.

The cotton plant is subject to many diseases and is often attacked by insect pests, of which the worst is the boll-weevil. Owing to these diseases and insect pests, and the difficulty of getting cheap labour, the

American cotton crop has declined of late years, but the demand for cotton continues to increase. For this reason efforts are being made to increase the cotton-growing area in Egypt by extending the irrigation works. Encouragement is given to the production of cotton in other parts of the British Dominions. Cotton is now being grown successfully in Queensland (Australia) and various parts of Africa—Nigeria, Sudan, Uganda, Kenya, Tanganyika, Nyasaland and Natal—and the W Indies, so that most of these countries will probably become large producers. The diagram,

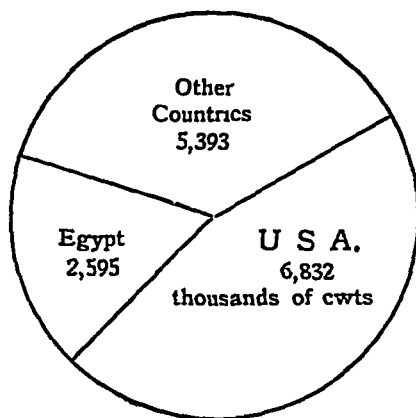


FIG 130 —RAW COTTON—SOURCES OF BRITISH SUPPLY  
In thousands of cwts

Fig 130, shows the sources of a year's supply of cotton for the factories of Britain. It is evident that more than half the supply comes from U S A , and that other countries, excepting Egypt, contribute but a small share of raw cotton to the British mills.

**Cotton Manufactures** The textile industries use the fibres of both vegetable and animal origin as their raw material, and manufacture their products by spinning and weaving. The chief

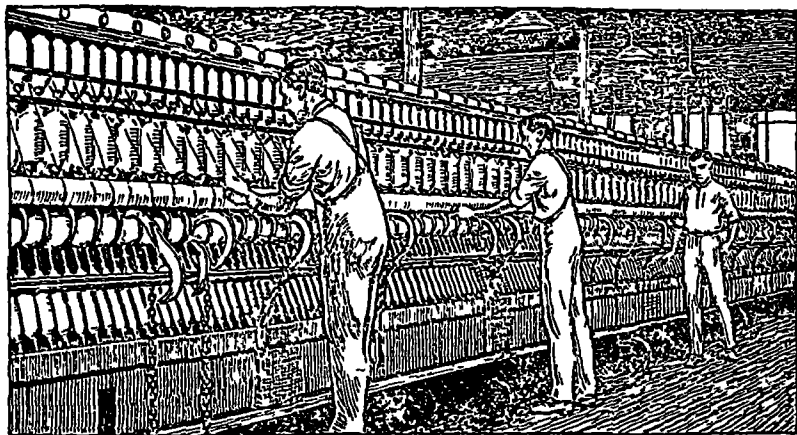


FIG 131 —COTTON SPINNING

fibres used are cotton, wool, flax, hemp, jute, silk, and coir. Spinning consists in twisting the raw material into thread or yarn. In weaving, two threads are used, one across the material and the other along its length. The former is called the *weft* and the latter the *warp*.

Spinning of thread and yarn is the most difficult part of the work that has to be undertaken, and the difficulty increases with the fineness of the material that has to be produced. The finest threads can only be spun satisfactorily in areas having a humid climate. This specially applies to the cotton industry. With certain fibres,

such as jute and flax, the necessary dampness can be obtained by the application of water. The humidity of the atmosphere is not important with wool or silk fibres.

Textile materials are made, by primitive methods, in many parts of the world, but the peoples of the British Isles, the United States, Germany, and France are the great manufacturers of the bulk of material by modern machinery. Certain of the coal areas in these countries have developed into textile centres, since local fuel lessens the cost of production.

In England, skill in spinning and weaving was acquired from the Flemish people early in the fourteenth century. Simple handlooms were first used, and by a series of wonderful improvements the present remarkable machines have been developed.

The possession of machines, when steam power began to be used, gave us a good start in the manufacture of textiles, and enabled us to secure many markets overseas.

Cotton spinning and weaving is the great industry of the coalfield of S Lancashire, and it is the most important area of the world for the work, Fig 132. Nearness to the sea and to the river Mersey, coupled with the local supplies of coal and iron, have considerably helped the industry to progress, but the chief asset of the region is its humid climate. The damp atmosphere aids the spinning and weaving of the finest cotton thread and yarn, and Lancashire is without any serious rival for what are called the *finest counts*. Ships from U S A can land their cargoes of cotton at Liverpool, or proceed by the Manchester Ship Canal to Manchester.

There are many large factory towns in S Lancashire, indeed, one-eighth of the people of England live in Lancashire. The largest town of all is Manchester, which stands where the Irwell enters the plain. Its population (with Salford) is 989,000. Manchester is less a manufacturing city than a city of warehouses, offices, and shops, for it is the great storehouse for the towns around. In addition, it

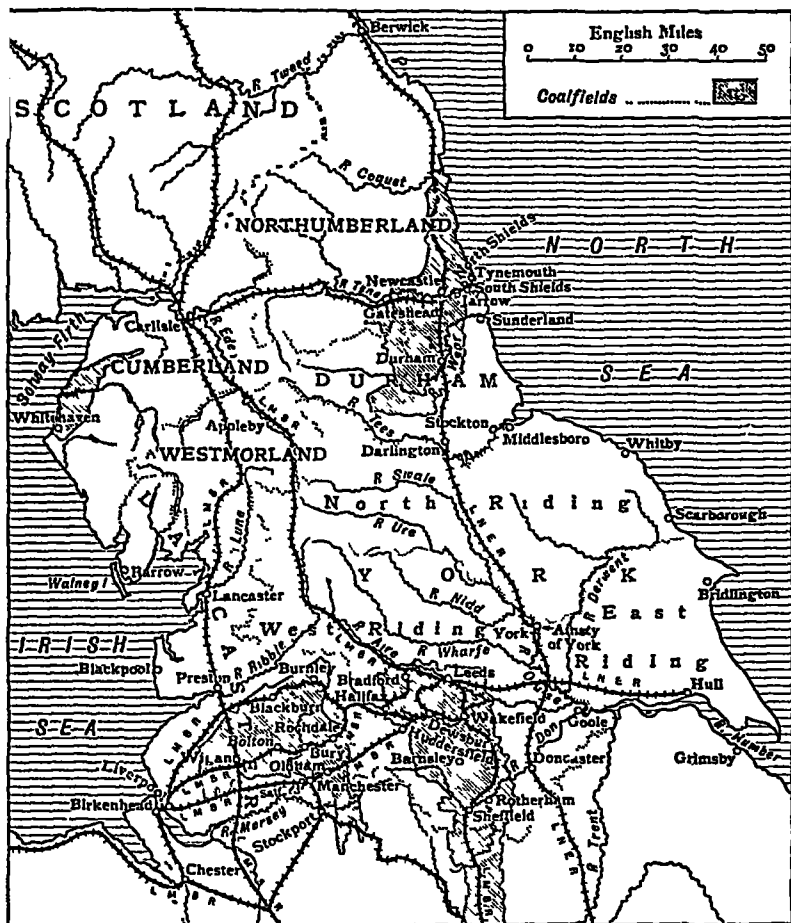


FIG 132 — INDUSTRIAL AREAS OF NORTHERN ENGLAND

supplies enormous quantities of machinery, boilers, rails, bridges, locomotives and such goods to the surrounding towns By the cutting of the Manchester Ship Canal it has become the third port

was once the great wool exporting country of the world, and, indirectly, it has a great share in the export trade of to-day, for London is the world's great wool mart to which Australian and other wool is sent for purchase by buyers from other countries

**Woollen manufactures** The manufacture of woollen goods began in the British Isles in areas having a local supply of wool, coupled with a good water supply. There were centres for the making of cloth on the slopes of the Pennines in Yorkshire, and near the hill country bounding the Tweed Valley of Scotland, for both districts have running streams and good pasture for sheep. To-day the West-Riding of Yorkshire, with its own supply of coal, is the important area for the woollen industry. It is on the dry side of England, but a dry atmosphere is not a handicap in the weaving of a coarse fibre like wool, for it is kept moist with oil during the weaving process. Yorkshire has outgrown its own supplies of wool, and considerable quantities are imported. Australian wool is landed at the London docks, Argentine wool at Liverpool, and the wool from Central Europe goes to Hull. The manufactured goods are exported by Hull to Europe, and by Liverpool to other parts of the world. It should be noted how valuable are the railways which cross the Pennines from Yorkshire to Lancashire (Fig 132). Noted woollen manufacturing towns are Leeds, Bradford, Halfax, Huddersfield, Wakefield, Dewsbury. Many varieties of woollen goods are made, but generally each town specialises in some particular article.

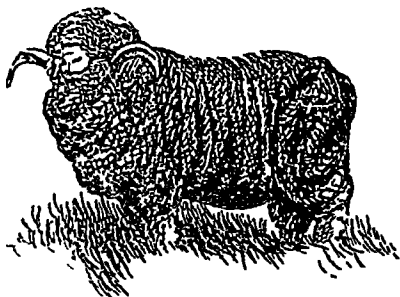


FIG 133 — THE MERINO SHEEP

*N B*—The cotton and woollen manufacturing centres of France, Belgium, Germany, etc., are dealt with in Chapter XIX

## CHAPTER XVIII

## INDUSTRIAL AREAS—THE BRITISH ISLES

**Coal** The map, Fig 134, shows the chief areas of the world where coal, iron, and petroleum respectively are found. The five principal coal-producing countries of the world are U.S.A., Germany, United Kingdom, France, and Czechoslovakia.

Modern manufacturing and industrial areas depend to a very great extent on the presence of coal and iron in the immediate vicinity. Coal is the chief fuel used to develop power, but oil, gas, and water are used to a lesser extent.

Coal is wood hardened into rock. In distant ages, forests growing in swampy places covered the earth in many parts of the world. As the forests decayed great beds of peat-bogs, often hundreds of feet thick, were formed of their dead trunks and leaves buried in water. As the crust of the earth sank, the ocean covered the bogs with layers of sand or shells, which hardened into sandstone or limestone. The enormous weight of the rock and water, with chemical changes that took place, caused the layers of decayed vegetable matter to become hard black coal. After ages of time that part of the crust slowly rose again and became dry land, leaving coal beds near enough to the surface to be dug out of mines.

In a mining area huge wheels that wind up the cages mark the sites of the mine-shafts. Great tips of useless rock form one of the characteristic features of all mining districts. Railways are a necessity in a coal-mining area, in order to provide routes, and in many places much use is made of canals. Many of the coal areas in Britain are favourably situated near the sea and are thus in touch with ports.



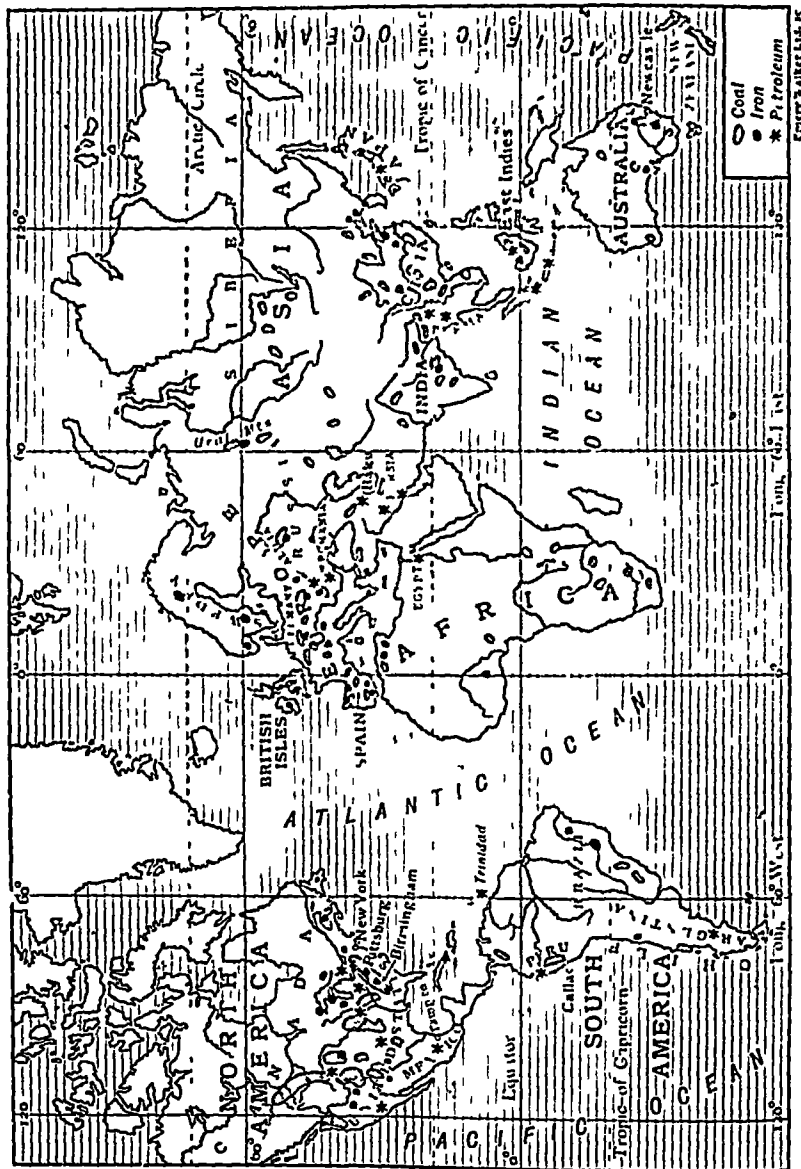


FIG 131.—THE WORLD'S COAL, IRON AND PETROLEUM

FRUIT & SEED CO., INC.

**Iron.** Notice on Fig 134 the chief iron-producing countries of the world. Iron is never found pure in nature, but always in the form of ore. It is therefore an advantage if it is found near coal, as large quantities of fuel are needed to smelt the iron ore in blast-

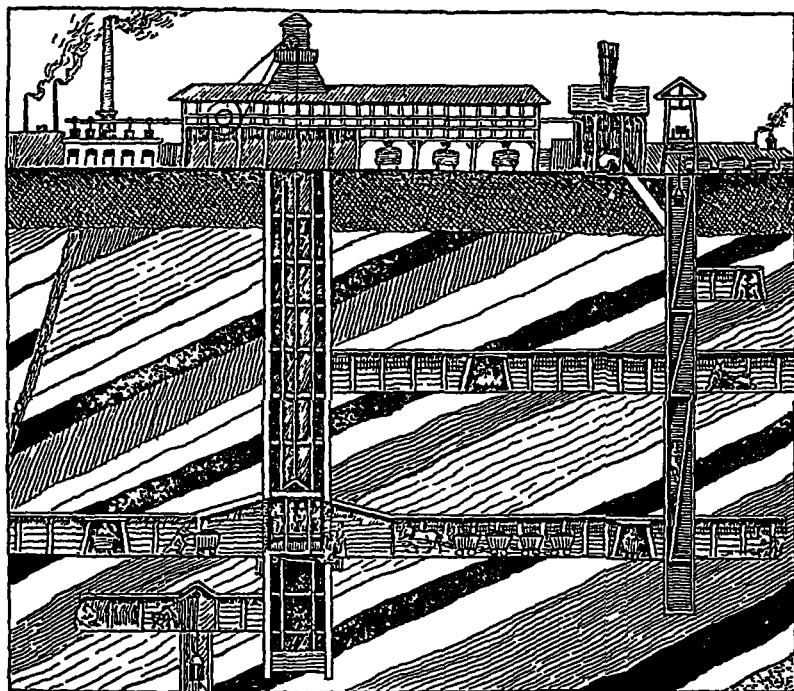


FIG 135—SECTIONAL VIEW OF A COAL MINE  
The black bands are coal, the rest is clay shale, or sandstone

furnaces so as to extract the metal. Britain has excellent iron ore in the Cleveland district of Yorkshire, Northamptonshire, North Lancashire, Staffordshire, South Wales, and in the Clyde Valley. Most of these districts are near coal, and have become smelting and iron-working centres. Supplies of iron near the sea lead to the

shipbuilding industry The ports of South Wales, the Clyde, Lancashire, Northumberland and Durham are noted for the building of ships

**Sweden** is rich in iron ore, but has no coal The greater part of the ore is sent to Sheffield to be used in the manufacture of cutlery **Spain** has rich deposits of iron ore near the northern coast, but the greater part is sent to South Wales to be smelted **Germany, France, and Russia** are rich in iron ore and have developed the manufacture of iron goods

The **United States** is the richest country of the world for iron ore, the chief deposits being found near Lake Superior Pennsylvania, near the Great Lakes, is a noted iron-working region

Machinery is a product of the iron industry, and it is usually made on those coalfields which also possess iron ore The machinery of to-day is very intricate and of very great variety It is usual for towns to specialise in the manufacture of one class of machine. Thus Oldham, in the cotton area of Lancashire, makes spinning and weaving machines adapted to the manufacture of cotton goods Keighley, in Yorkshire, makes the machines for use in the woollen mills Railway centres, such as Crewe, Doncaster, and Derby, make locomotives Towns in the Clyde Valley make ships' engines, since shipbuilding is an important industry in the Clyde estuary Such a method of working leads to the best results

**Petroleum** Study Fig 134, which shows the chief sources of supply of petroleum, and notice the great importance of the **United States and Mexico** In the United States, the states of Pennsylvania, California, and Texas have the largest output, and in Mexico the oilfields are near the port of Tampico The oilfields of Asia, which are situated in Persia, Burma, Java, Sumatra, Japan, and Borneo, promise to be valuable sources of supply Discoveries of oil have also been made in Peru and Colombia, in South America

Crude petroleum is obtained from the earth by deep borings, and by processes of refining can be made to yield petrol, paraffin, naphtha, benzine, lubricating oils, vaseline and paraffin wax. It should be noticed that most of the oilfields are at considerable distances from centres where refining can be carried out, and from places where

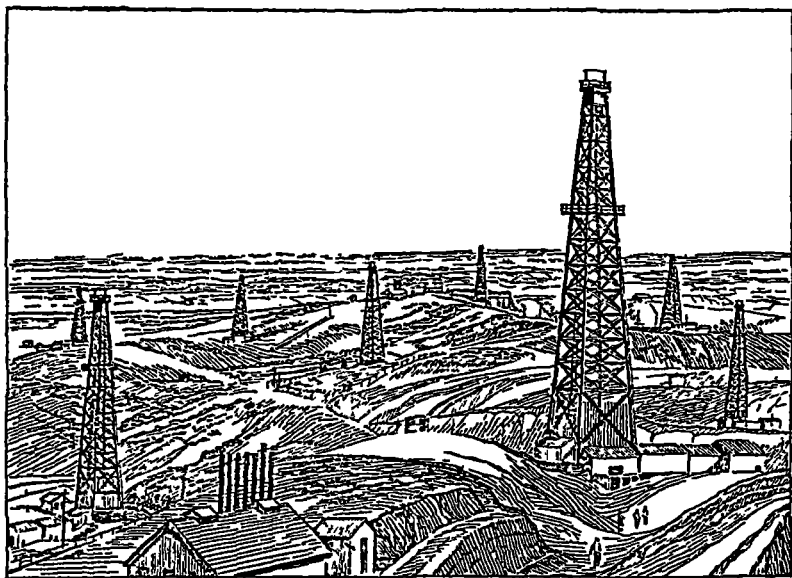


FIG 136 —OILWELLS IN CALIFORNIA

it is required in large quantities. As a result, the oilfields are usually supplied with pipes, running to a convenient port, along which the oil can be pumped into the steamers which are to convey it across the seas. In cases where coal is near at hand it is pumped to the coalfields for refining. In Colombia, the export of oil has only just begun, after the completion of a 350-mile pipe-line to the port of Carthagena.

The importance of the products of petroleum has increased, to a

wonderful extent, during recent years Petrol is needed by motor-cars and airplanes, and many steamers are now driven by oil fuel In U S A alone there are about 25,000,000 registered motor-cars

Lubricating oils are needed in all machinery, and naphtha is an essential oil in rubber factories The uses of the products seem likely to increase considerably in the future This means that any spot on the earth where petroleum is found will be thoroughly investigated to determine its value

**Water power** In some parts of the world which are deficient in coal, power from running and falling water is used to work machinery or to develop electricity The advantage of electrical energy, or hydro-electric power, is that it can be conveyed by means of wires to considerable distances from the place where it is generated In Quebec, Switzerland, Norway and Sweden water power and hydro-electric power are largely used in lumbering occupations, the Falls of Niagara are used to develop electricity, which is conveyed to distant towns for power and light

Electric energy developed by *burning coal* is largely used in modern towns all over the world for driving trains and numerous machines In most towns that are electrically lighted we find electric motors in use at the hairdresser's, grocer's (coffee-mill), corn chandler's (chaff-cutting), baker's (mixers), and butcher's (fans) In many households will be found an electrically-driven carpet-sweeper The plant needed for developing hydro-electric power is elaborate and expensive, but *water*, the source of the power, is cheap, so that more and more use of hydro-electric power is being made in various parts of the world

### BRITAIN

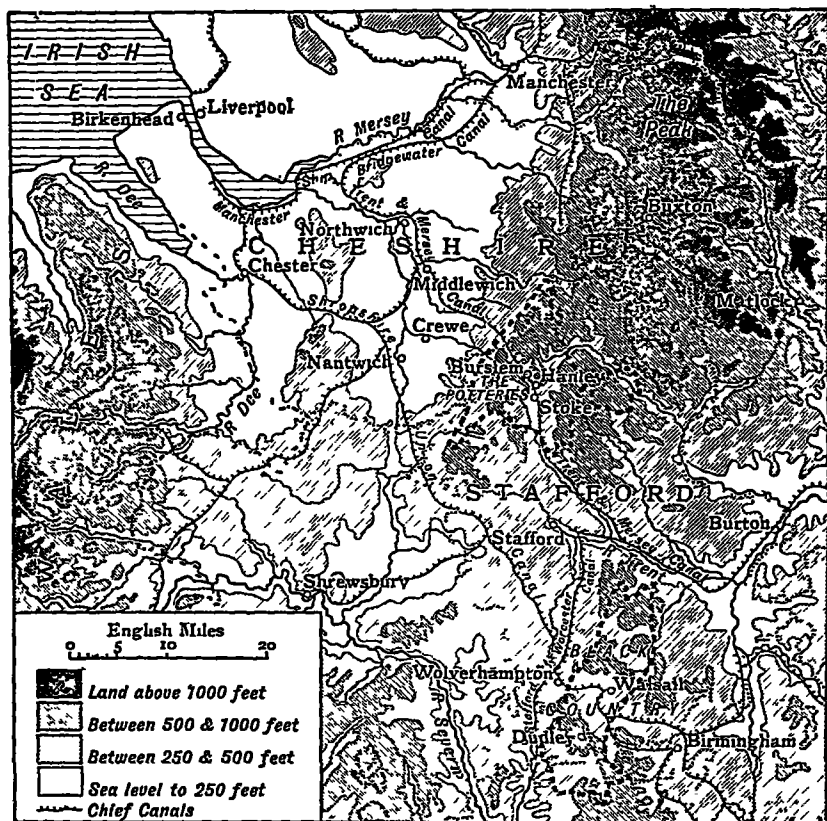
The world's greatest manufacturing and industrial areas are those of Europe and North America We have already noticed how the cotton industry of Lancashire and the woollen industry of

Yorkshire have developed near two very important coalfields. Though woollens form the staple industry of the Yorkshire coalfield, there are many others. The well-known *Silkstone* coal comes from a village near Barnsley. Leeds has smelting-furnaces and engineering works, sandstone for paving-stones is obtained from the coal-measures near Halifax, farther south, where the sandstones are particularly useful as grindstones for sharpening steel tools. The world-famous **Sheffield** cutlery industry has developed. **Derby**, an important railway junction, has great locomotive and carriage-building works. **Nottingham**, long famous for lace and hosiery, has also manufactures of cycles and motor-cars. Half of the household coal sent to London by rail is said to pass between Derby and Nottingham.

One of the most important coalfields in England is the South Staffordshire coalfield called the **Black Country**. The coal-measures here contain valuable iron ore. The smelting of iron and the making of iron goods is an old-established industry. Four hundred years ago in the neighbourhood of **Birmingham**, there was a flourishing business in smelting iron with charcoal obtained from the Forest of Arden. **Birmingham** mainly specialises in the manufacture of small articles made of iron, such as pins, needles, metal buttons, screws, tools, guns, and hundreds more. The chief reason for this is that, being situated almost in the centre of England, most of the carriage of goods is done by rail. **Birmingham** is some distance from the coalfield, but other noted towns of this district on the coalfield itself are the great iron-smelting towns of **Wolverhampton**, **Walsall**, **West Bromwich**, **Dudley**, **Wednesbury**, and many smaller places, all engaged in coal-mining or some branch of the iron industry. (Fig 137)

About 150 years ago Josiah Wedgwood founded the pottery industry on the **North Staffordshire** coalfield, because the clays of the coal-measures were found to be suitable for making china.

The industry has now grown to such an extent that the large towns of Stoke-on-Trent, Hanley, Burslem, etc., are joined together to



The Staffordshire Coalfields shown by thick dotted line thus - .....

Emery Walker sc

FIG 137—MAP OF CHESHIRE AND STAFFORDSHIRE

Note the Potteries and the Black Country

form one county borough The whole district is called The Potteries China clay is largely brought from Devon and Cornwall, but the nearest port is on the Mersey Both railways and canals are used as routes





from Bilbao, on the north coast of Spain Swansea has a great tin-plate industry, that is the coating of iron plates with a thin layer of tin to protect the iron from rusting Most of the tin originally came from Cornwall, a short journey across the Bristol Channel, but the greater part of it now comes from the Malay Peninsula



FIG 139 —DRYING JUTE ON BAMBOOS IN INDIA FOR THE DUNDEE JUTE MILLS

**Scotland** The four most important Scottish coalfields are the Ayrshire, Lanarkshire, Midlothian, and Dunfermline coalfields (See Fig 36) The Lanarkshire coalfield is the busiest industrial district in Scotland Here are cotton, silk, and woollen industries, metal works, chemical works, potteries, sugar refineries, and on the Clyde estuary the largest shipbuilding industry in the world

Iron ore from the coalfield is nearly exhausted, but iron ore is largely imported, and there are great blast-furnaces at Motherwell, Wishaw, Coatbridge, Carron, and other places

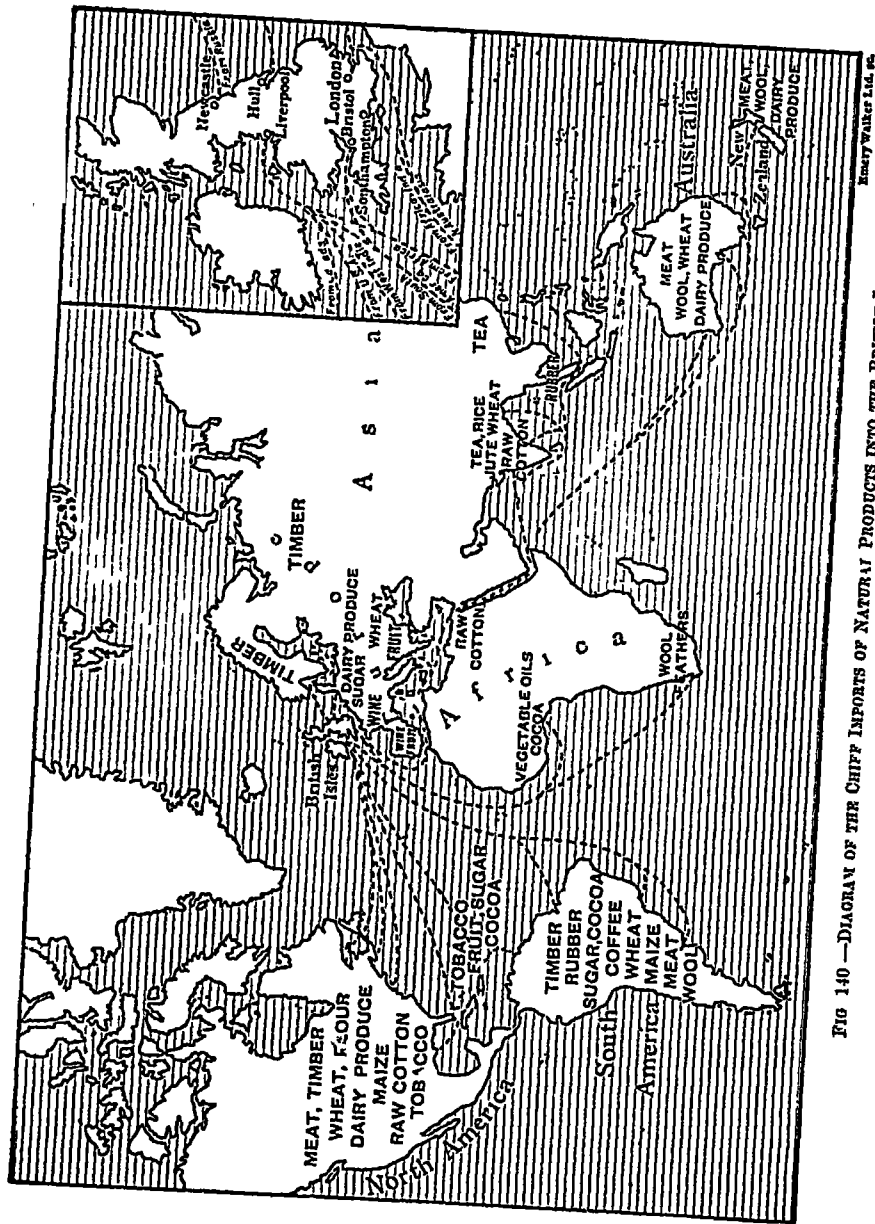


FIG 140 —DIAGRAM OF THE CHIEF IMPORTS OF NATURAL PRODUCTS INTO THE BRITISH ISLES

In the vicinity of the Ayrshire coalfield are many busy ports—**Ardrossan, Troon, and Ayr**—from which much coal is shipped to Belfast in Ireland. **Kilmarnock** is a noted engineering town, where locomotives and pumping machinery are specially made (For Glasgow, see p 61)

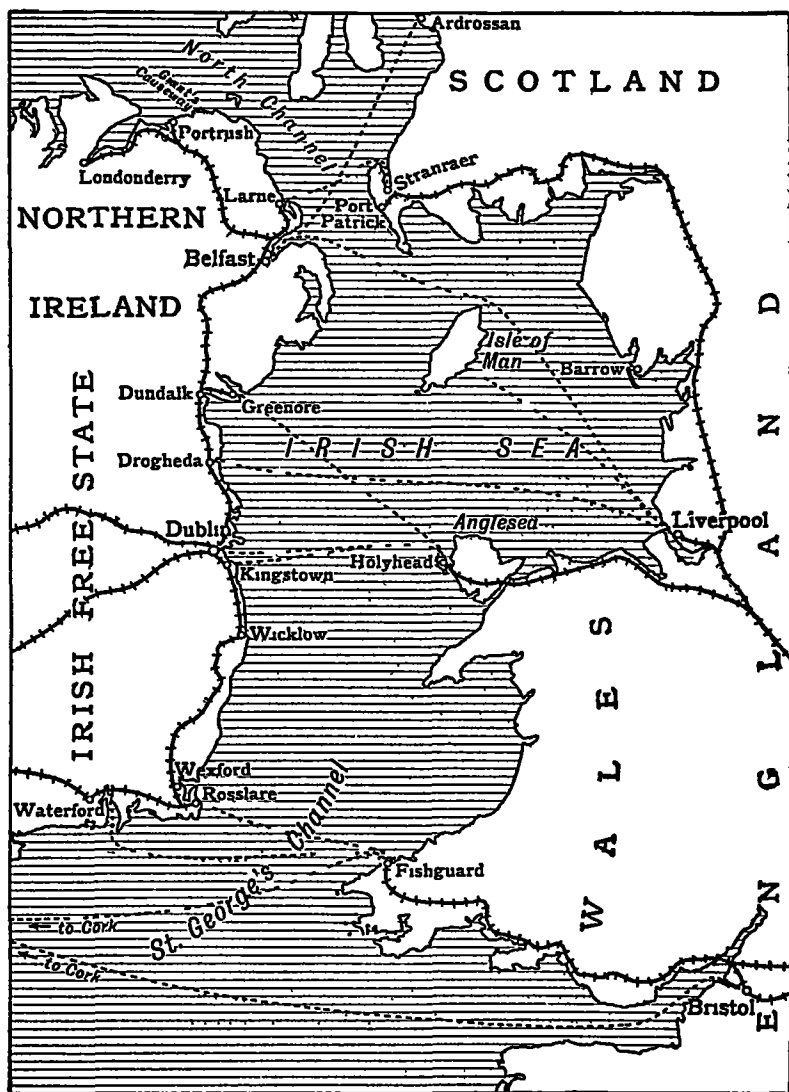
Important industries associated with the Dunfermline coalfield are jute-weaving at **Dundee**, linen-weaving at **Dunfermline**, and the making of oil-cloth and linoleum at **Kirkcaldy**. The flax for the linen is obtained from Western Europe, the jute mainly from India, the cork for the linoleum from Spain

There are many important manufacturing towns in Britain that are not situated on coalfields. As we saw in Chapter VI., London is a great manufacturing centre. **Northampton, Leicester, and Norwich** are noted for boots and shoes. **Bristol** has manufactures of tobacco, sugar-refineries, and chocolate works, market centres such as **Lincoln, Grantham, Peterborough, Bedford, Chelmsford, Ipswich**, and many others specialise in the manufacture of agricultural implements

The chief exports of the United Kingdom are the products of the textile industries, which make up about one-third of the total value. These are, in order of importance, cottons, woollens, linens, silk and jute manufactures, and clothing. Next in importance come iron and steel in all forms, coal, copper wares, bronze and brass wares, earthenware and porcelain. **Herrings** are the principal non-manufactured export next to coal

The principal imports of the United Kingdom are graphically illustrated on the map of the world, Fig 140

Ireland is not a great manufacturing country, for coal is scarce. The chief occupation of the people is the rearing of cattle, horses, and pigs, and the growing of potatoes and, in some parts, flax. The Irish ports have little direct foreign trade, especially of exports. **Dublin, Belfast, Cork, Waterford, Limerick, and Londonderry**, all



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FIG 141.—MAP SHOWING THE SEAPORTS AND STEAMER ROUTES OF THE IRISH SEA

import wheat and maize in large quantities, and Belfast imports flax for her linen manufactures. Much cattle, swine, butter and other dairy produce are sent to the densely populated industrial areas of Glasgow, Liverpool, etc., and there are fast passenger steamer lines across the Irish Sea. (See Fig 141)

Belfast, the largest city in Ireland, has important shipbuilding yards and manufactures of linen, tobacco, aerated waters, and flax machinery, besides the industries of distilling, rope-making, and bacon-curing.

### Notes

Newcastle-on-Tyne is an ancient *bridge town*, it stands eight miles up the Tyne, at the lowest point where the river was easily crossed. William the Conqueror was responsible for the building of the *new* castle.

Oilcloth is a type of floor-covering consisting of coarse canvas made from jute coated on both sides with thick oil paint.

Linoleum is made from linseed oil mixed with gum resins, cork dust and various colour pigments. This mixture forms a thick paste, which is spread on a linen fabric and passed through heated rollers.

Falls of Niagara, between Lakes Erie and Ontario, are divided by Goat Island into the American and the Canadian, or Horseshoe, Falls. The former is 167 ft high, and the latter has a height of 159 ft. At the foot of the Falls the water rushes through a gorge seven miles long. The total width of the Falls is 4060 ft.

The Falls have been used as a source of power to drive machinery for generating electricity, which is supplied to towns in the neighbourhood.

### Exercises

- 1 Explain the map, Fig 134
- 2 Write short notes on the importance of water power and petroleum
- 3 Name three important coalfields in Britain and the industries associated with them
- 4 Where and for what noted are Leeds, Birmingham, Swansea, Newcastle, Kilmarnock, Kirkcaldy?
- 5 Explain the following: Black Country, Potteries, raw materials
- 6 Explain the illustration, Fig 135

7 Name the chief shipbuilding districts of Britain Give reasons

8 State some of the peculiar advantages which Britain has for foreign commerce

9 Explain the map, Fig 140, giving the names of the chief countries from which the several products listed are exported

10 What are the chief requirements for a manufacturing centre ? Give examples

11 What is the best situation for a coalfield ? Illustrate your answer by reference to two British coalfields

12 Re-write the following, filling in the blanks A confectioner in London made a plum pudding with foreign flour brought from \_\_\_\_\_, foreign butter from \_\_\_\_\_, currants from \_\_\_\_\_, spices from \_\_\_\_\_, cane sugar from \_\_\_\_\_, foreign eggs from \_\_\_\_\_ The ship in which the flour was conveyed was made at \_\_\_\_\_, teak for the ship was brought from \_\_\_\_\_, cotton for the pudding cloth was brought from \_\_\_\_\_ and made into calico at \_\_\_\_\_, and conveyed by the railway to London

## CHAPTER XIX

### INDUSTRIAL AREAS—EUROPE AND AMERICA

**France** The greater part of the mainland of France is made up of plains or broken hilly country which offers little hindrance to communication The plain, which is watered by the Seine and its tributaries, is a belt of pasture land, orchards, and fertile wheat lands, for the climate is similar to that of England on the opposite side of the Channel In the north-east are the chief manufacturing towns The most important railway is from Paris to Dijon, and then southwards down the Saône-Rhone valley through Lyons, the most important silk manufacturing centre in the world, through Avignon to Marseilles. Other important railway routes are from Paris by Orleans to Tours, Bordeaux, and Toulouse There is only one railway across the Alps into Italy, this passes through the Mont Cenis tunnel The Jura and Vosges mountains on the

eastern frontier considerably obstruct communication with Switzerland and Germany

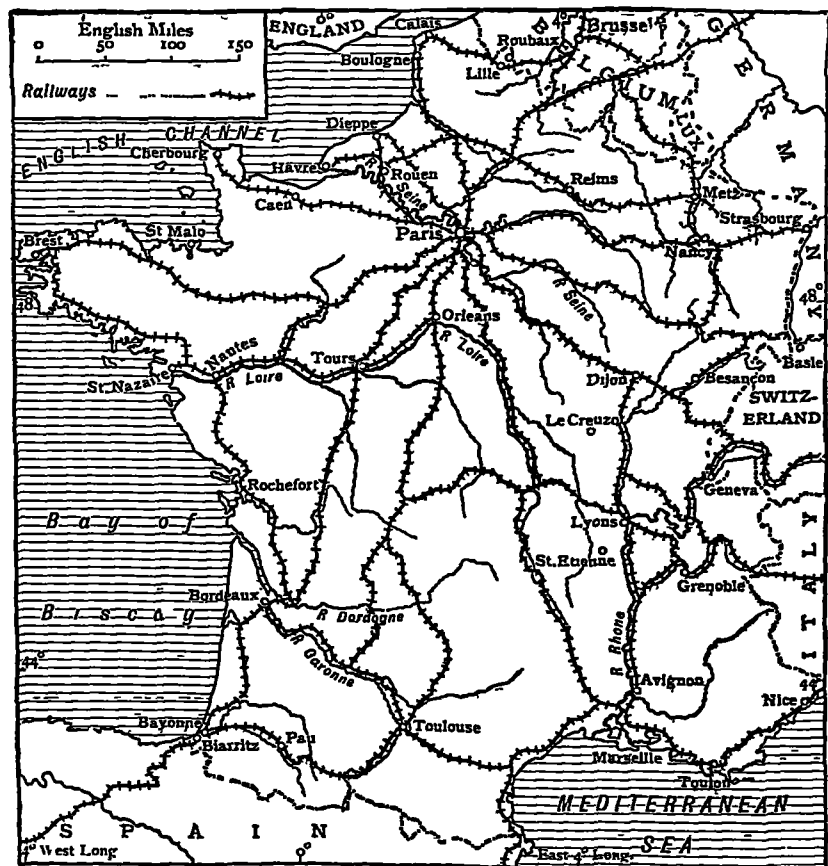


FIG 142 — FRANCE—RAILWAYS AND TOWNS

Note how the chief railways spread in all directions from Paris

Inland navigation in France is of much greater importance than in England. All the great rivers on the west are joined by canal

with the Rhone or the Rhine in the east. The chief inland navigation is in the north-east where the country is flat. Much use is made of canals in this district for the carriage of coal and minerals.

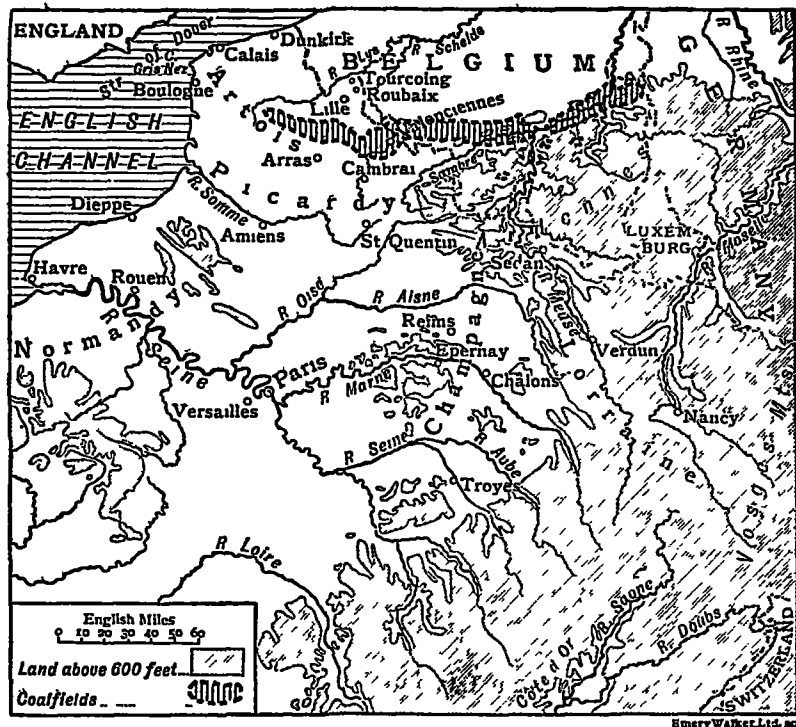


FIG 143—FRANCE—SEINE BASIN AND VALENCIENNES COALFIELD

Note that the chief textile manufacturing towns are situated near the coalfield

and manufactured goods from the industrial centre of the Valenciennes coalfield, Fig 143

One of the oldest industries in France is the manufacture of woollen goods. From early times sheep have been pastured on the chalk uplands of Picardy, and as coal can be readily obtained from



the Valenciennes mines, Roubaix makes broadcloth, and Tourcoing specialises in carpets

Lille, the largest town in this district, makes cotton and linen goods, it has sugar refineries and distilleries, chemical and engineering works Valenciennes is noted for lace, and Cambrai for linen goods Rouen, on the lower Seine, is the cotton port and cotton manufacturing centre

St Etienne, on the west side of the Rhone valley below Lyons, is the centre of the second largest coalfield in France, here are important iron and steel works and a small-arms factory St Etienne may be called the *Birmingham* of France, silk goods are also made in this district, ribbons and laces are important cottage industries

Le Creuzot, among the mountains north of Lyons, also has coal and iron mines, and at this town are huge ironworks, where the largest cannon, besides locomotives and rails, are made Who has not heard of the famous Creuzot guns?

The principal seaports of France are as follows

Marseilles, the great Mediterranean port of France, deals with products from Spain, Italy, Africa, etc., and is well placed for trade with the Far East through the Suez Canal

Havre, at the mouth of the Seine, is the centre of the French trade with America Rouen, higher up the river, is the chief port for raw cotton

Bordeaux, on the Garonne, is noted for French wines, its outport is Pauillac

Dunkirk, the only French port on the North Sea, imports wool from S America and exports the manufactures of the Valenciennes coalfield

St. Nazaire, at the mouth of the Loire, is the outport for Nantes, with which it is joined by a ship-canal

## BELGIUM.

Belgium is mainly a flat country, so that there are excellent means of communication by road, rail, horse and steam tramways, canal and river. Belgium is intersected by railways, yet the weight of goods conveyed by inland waterways reaches more than 80 per cent of that carried by rail. Belgium is rich in coal-mines. Those of Charleroi and Mons are joined with the French mines of Valenciennes. The iron mines are now almost exhausted, and iron is mainly imported from north-east France and Luxembourg. Although more than one-half of the people work on the land, Belgium is largely a mining and manufacturing country.

Even in early days, before coal and iron were used, Bruges, Ghent, and other towns in Flanders were noted for cloth, which was made from wool imported from England, and splendid old buildings still remain to remind us of the former greatness of the cloth merchants of Flanders. The shallowness of the waterways to these towns has partly prevented their growing larger, but there is now a deep harbour at Zeebrugge, opposite Bruges, and Ghent is joined by canal with Antwerp. The trade in linen, made from home-grown flax, is greater to-day than that in cloth. The four chief cities are Brussels, Antwerp, Liège, and Ghent.

Brussels, the capital, is the centre of railways, roads, and canals, which make it easy for flax, wool, and coal to be brought to the city. Its two chief industries are carpet and lace making.

Antwerp, about half the size of Brussels, has also many railways and canals. The docks have been largely extended, and Antwerp is now one of the chief ports on the North Sea. Liège is the *Birmingham* of Belgium, and is noted for coal, steel-rails, fire-arms, machinery, glass, and chemicals. Ghent is chiefly engaged in making linen and cotton goods.

## GERMANY

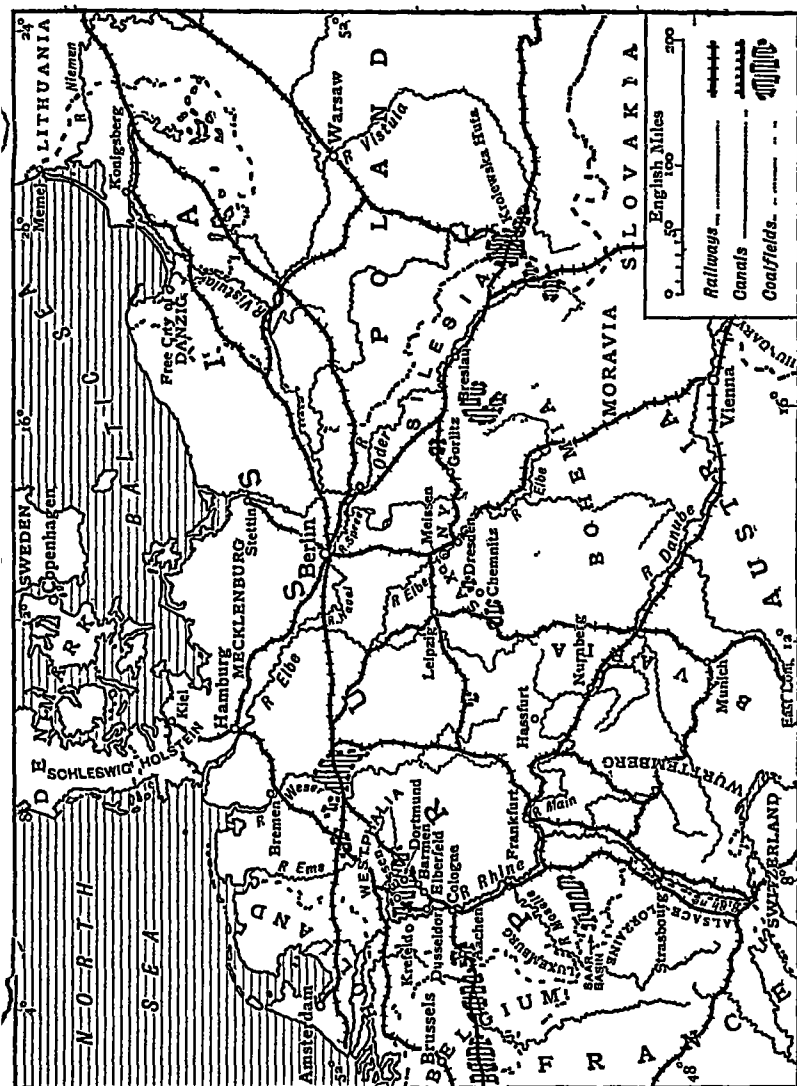
The waterways of Germany are of great value to its commerce. The most important navigable rivers are the Rhine, Elbe, Oder, Vistula, and Danube. The rivers of the northern plain are joined by many canals, but the Rhine is the chief waterway and the most important in Europe. Much timber is floated down the eastern rivers.

The Kiel Ship Canal joins the Baltic and North Seas and saves a day's journey for steam vessels by way of Jutland.

Germany is becoming more and more an industrial country, for abundance of valuable minerals is found in different parts. The proportion of people engaged in mining and manufacture is not, however, so great as that in the United Kingdom. Out of every 100 people in Germany, about 18 work in mines and factories, while out of every 100 people in the United Kingdom, 21 work in mines and factories. There are three chief coalfields, around and near which have grown up cities of factories for the making of iron and steel goods, textiles, glass, chemicals and earthenware. The largest coalfield, where more than one-half of Germany's coal is mined, is in Westphalia in the valley of the Ruhr, a tributary of the Rhine, Fig 144. This coalfield is on the edge of the plain not many miles from the borders of Holland, which makes it specially convenient for importing raw materials and exporting manufactured goods, either by means of the Rhine through Holland or by rail and canal through Hamburg and Bremen.

The Saxony coalfield, which is much smaller than the Westphalian one, is in the valley of the Elbe, near the Erz Gebirge or Ore Mountains, the third coalfield is the Silesian coalfield in the upper valley of the Oder. The Erz Gebirge and Harz Mountains are specially rich in minerals.

Besides coal and iron, Germany has rich mines of zinc, silver,



Emory Walter Ltd. sc

FIG 144 —GERMANY—RAILWAYS AND TOWNS

Note how the chief railways spread in all directions from Berlin, and from the coal district of Westphalia

copper, and salts Germany produces more zinc than any other country in the world, besides nearly two-thirds of the European silver The different salts are used for bleaching and dyeing the textiles, for glass-making, chemicals, manures, and porcelain

Iron is in many places found close to the coal mines, but there is not enough to supply all the German needs, and large quantities are obtained from Lorraine and Luxembourg At one time Germany kept enough sheep to supply the wants of the woollen factories, but less sheep are kept now than formerly, for it is found cheaper to import wool from the great sheep-farms of S America and other countries Much of the textile manufacture is still done in the cottage homes of Germany, as it was formerly done in England, every year, however, sees the increase of factories and the decrease of work in the homes, except in the case of silk goods and the industry of clock and toy-making, which is largely carried on in the Black Forest district Another great industry of Germany is that of paper-making, printing, and book-making

The most important industrial towns of Germany are here listed for reference

#### *The Westphalian Coalfield*

Essen is noted for Krupp's iron and steel works, especially for cannon, armour plates, and machinery

Aachen (Aix-la Chapelle) makes woollen goods

Bielefeld makes rude and linen goods, the flax being chiefly brought from Belgium

Elberfeld-Barmen is the Manchester of Germany and has a huge calico trade

Dusseldorf manufactures glass and hardware

Cologne is noted for scents, chocolate, chemicals, and glass

Crefeld makes silk goods

Dortmund has extensive collieries

*The Saxony Coalfield* is the busiest manufacturing district in Germany and has the densest population

Chemnitz, the centre of the textile industry, makes hosiery, shawls, and cotton goods, in addition there are great factories for making engines, machinery, boots, shoes, gloves, toys, glass and paper

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Dresden is specially famed for its museums and art galleries, the famous Dresden china is made at Meissen, a few miles distant

Hassfurt is the most important town in Germany for making chemicals, which are used in the textile factories for dyeing and bleaching, etc., as well as for manure and medicine

Leipzig, is the centre of the paper and book trade, of the manufacture of pianos and musical instruments. It is well placed for inland trade on the edge of the plain, and twice a year great fairs are held, to which come merchants from all over the world to place their orders and inspect the wares

### *The Silesian Coalfield*

Breslau, the capital of Silesia, is one of the great woollen manufacturing centres of Germany. The country round has long been famous for its fine wool, although much is now imported from S. America.

Görlitz makes woollen goods. Königshttte, the chief centre for the zinc trade, now belongs to Poland. You should look up the names and positions of the chief seaports, especially Hamburg, Bremen, Königsberg, Kiel, Stettin, and Danzig. Danzig is now a "free port." The Baltic ports are frozen during the winter months.

## UNITED STATES

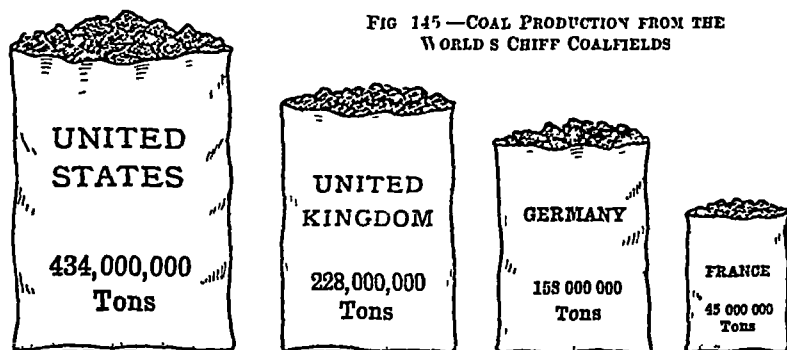
The United States is the greatest coal and iron producing country in the world. The diagram, Fig 145, shows the comparative amounts of coal mined by the four greatest world producers of this mineral during a year.

The position of the chief coalfields of the United States is shown on the map, Fig 146. Of these, the most important at the present time are the Appalachian coalfields, which extend almost throughout the length of the Appalachian Highlands, and the Central coalfields, which lie south of the Great Lakes. Much of the Appalachian soft coal can be readily mined by means of galleries cut into the hillsides, this is an enormous saving of labour and time when compared with the sinking of shafts deep below the surface. The hard anthracite coal, which is used on warships and in stoves, lies at a lower level than the soft coal and can only be reached by means of deep shafts.

In addition to coal, from which gas and the by-products of tar and dyes are obtained, the United States is specially rich in oil wells and natural gas. The chief oilfields lie south of Lake Erie in the neighbourhood of Pittsburg and Cleveland.

Iron ore is chiefly got from the districts near Lake Superior and in the southern part of the Appalachian coalfield. The Lake Superior mines are the world's greatest source of iron ore. The chief centre in the United States for the manufacture of iron and steel is Pittsburg, and the reason for this should now be clear.

FIG 145.—COAL PRODUCTION FROM THE  
WORLD'S CHIEF COALFIELDS



Pittsburg is well supplied with coal, oil, and natural gas. The iron mines in its neighbourhood have been worked out, so iron ore is now shipped at Duluth and transported through the lakes to Erie and Cleveland on Lake Erie, and thence by canal or rail to the Pittsburg district.

Birmingham, in Alabama at the southern end of the Appalachian Highlands, is the "Pittsburg of the South." In Red Mountain, near by, are inexhaustible supplies of iron ore, coal, and limestone, consequently Birmingham is the southern centre for iron manufactures. It is due to the coal and iron supplies of Birmingham district that cotton manufacturing towns are springing up in some of the south-eastern cotton states. There are, of course, many

other towns in the States which make iron goods, especially railway rolling stock, farm implements, and domestic hardware, but the districts about Pittsburg and Birmingham are the most important

**Cleveland**, on the shore of Lake Erie, is an important manufacturing and commercial city. From its position on the Lakes it is

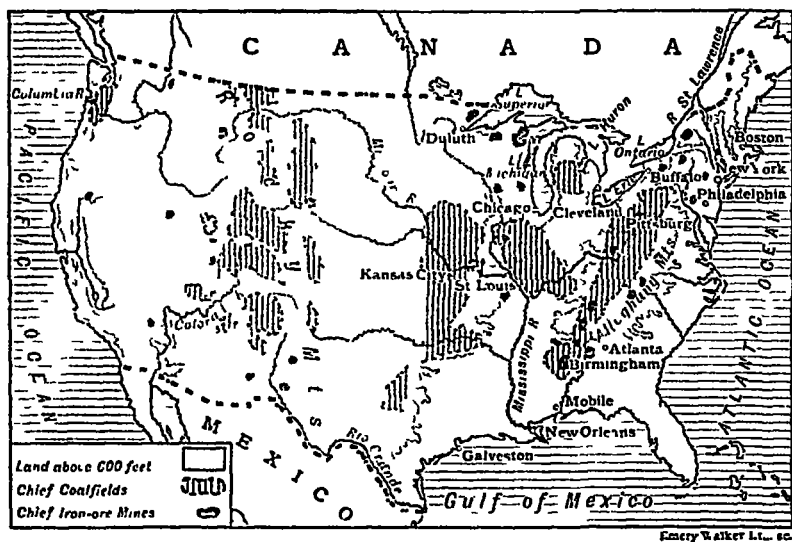


FIG 146—THE UNITED STATES—COALFIELDS AND IRON ORE MINES

able to deal with the iron for Pittsburg which comes from Duluth, for Cleveland is now joined to Pittsburg by canal and railway. In addition, one of the chief transcontinental railways passes through the city, and it has supplies of natural gas and petroleum. Cleveland has a big lumber trade and great iron factories for automobiles, steel rails, steel for buildings, cotton presses, sewing machines, and other things. Cleveland is the greatest iron market in the world. At Detroit are the noted Ford motor works.



**Buffalo**, at the east end of Lake Erie, also has important manufactures of iron and steel. Owing to the presence of the Niagara Falls between Lakes Erie and Ontario, much grain, timber, and other goods are brought by lake steamers to Buffalo and are then sent by the Erie Canal, or by rail, to New York.

Copper is found in large quantities in the peninsula between Lakes Superior and Michigan, within easy distance of the Soo Canals. It

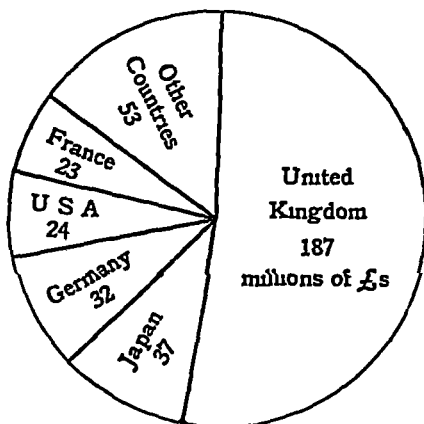


FIG 147 — COMPARATIVE EXPORTS OF COTTON MANUFACTURES  
IN MILLIONS OF £'S STERLING

is a highly valuable metal, used especially in the manufacture of electrical fittings. The Red Jacket Shaft is equipped with engines that hoist ten-ton cars of ore from the depth of a straight mile in a minute and a half. This shaft pierces the earth's crust, farther than any other hole in existence.

**The Atlantic Coast** The greatest number of the most densely peopled industrial cities lies near the Atlantic border to the east of the river St. Lawrence. The main reasons for this are

(1) These states were among the first to be peopled by the English settlers

(2) These states are the nearest to England and Western Europe

(3) The Appalachian Highlands, covered with thick forests, prevented the people spreading westwards to any great extent until the introduction of railways

(4) By means of the railways and canals the Atlantic cities can be readily supplied with grain and meat for food, coal and iron for their manufactures

(5) The falls, which are a characteristic feature of the rivers, are of immense service for driving machinery, chiefly by means of electric power To a far greater extent than in Canada, this hydro-electric power is used in the United States for driving street cars, for lighting the towns and for driving machines of every description

(6) These states are in the vicinity of the important Hudson-Mohawk water gap in the Appalachians It was through this gap that trappers and early settlers made their way northwards and westwards, through this gap roads and canals were constructed, to be followed later by many railways (The rivers, railways, and canals through this gap should be carefully traced on Fig 42 )

The manufactures carried on in these Atlantic states are mainly of such articles as are needed by the people Cotton goods are made in great quantities, the moist climate being similar to that of the Lancashire cotton district in England Woollen, silk, and worsted goods, carpets, furniture, leather goods, paper and printing, chemicals, vehicles of many kinds, food products, and a host of other things are made at various factories in the Atlantic states

Boston, on an inlet of Massachusetts Bay at the mouth of the River Charles, is the largest port of the New England States The New England States are Connecticut, Massachusetts, Rhode Island, New Hampshire, Maine, and Vermont Boston is one of the oldest

cities, being founded a few years after the landing of the Pilgrim Fathers at Cape Cod Bay

Fall River, Manchester, and Irwell are the chief cotton towns,

Waterbury and Waltham are world famous for watches, Holyoke is noted for paper-making Worcester and Providence for machine tools, and Worcester is also famous for its carpet factories

Philadelphia, south of New York, on the Delaware, in Pennsylvania, is the third seaport in importance after New York and Boston It stands nearly 100 miles from the sea at the junction of two small rivers A glance at the map, Fig 42, shows how splendidly it is served by railways and canals for getting coal and petroleum and iron manufactures from the Pittsburg district, and grain and meat from the west Philadelphia is not only a great port, but it has important manufactures

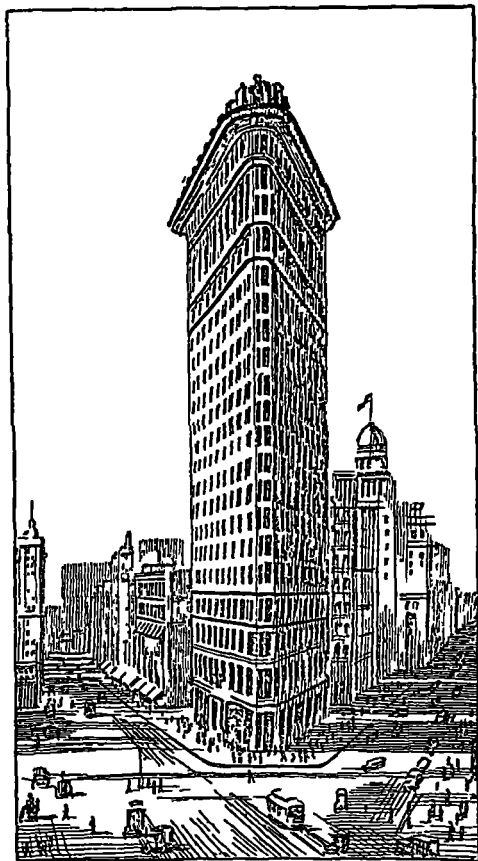


FIG 148 —FLAT-IRON BUILDING IN NEW YORK  
New York is noted for its "sky scrapers"

of cotton and woollen goods, carpets, leather goods, ships, and locomotives

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Washington, on the Fall Line of the River Potomac, is the site of the Capitol, where Congress meets (For New York see p 70)

### CANADA

Manufacturing in Canada is mainly carried on in Ontario and Quebec where the bulk of the people live, and where hydro-electric power has been furthest developed. There are important industries like the manufacture of motor-vehicles, agricultural implements, machinery and metal goods. The country's woollen and cotton mills are also mainly found in these provinces, as well as the manufacture of leather, boots and shoes, rubber, furniture, and pianos. The plant for the equipment of factories is made for the industries of flour milling, meat packing, dairying, canning and preserving, pulp and paper manufacturing, the making of wood products, and the treatment of ores. Canada has an important position among the mining countries of the world, mainly on account of the gold, silver, nickel and copper of Ontario.

### Exercises

- 1 Where and for what noted are the following places Lyons, Rouen, Liège, Dresden, Boston, Pittsburg?
- 2 Explain the situation of one large seaport in each of the following countries Germany, France, Belgium, U S A
- 3 State the positions of the chief European coalfields
- 4 What industries are associated with the coalfields of France?
- 5 Where in Europe are the following goods manufactured in large quantities woollens, cottons, iron goods, silk goods?
- 6 What natural advantages for commerce has U S A?
- 7 Explain the map, Fig 142
- 8 What do you understand by the *Manchester* of France, and the *Birmingham* of France?
- 9 What facilities for trade has Berlin? (Use Fig 144)
- 10 Give instances of inland towns in Germany and France that are well situated for trade
- 11 Explain the following The greatest number of the most densely peopled industrial cities of U S A lies near the Atlantic border

## CHAPTER XX

## MISCELLANEOUS PRODUCTS

**Silk** is a fibre obtained from the cocoons spun by the caterpillars of several varieties of moths. The eggs of the moth are hatched out by warmth on paper trays, then the larvae are fed with young mulberry leaves, or a species of oak leaves, and after three or four weeks begin spinning the cocoons. The silkworm only flourishes in warm temperate lands. Silk obtained by culture is whitish and yellowish in colour, but "wild" silk from worms feeding on oak leaves is brown. The cocoons are softened in hot water, and the ends from several cocoons are wound into a hank.

The true silk fibre, being continuous, is not spun like cotton, but "thrown," i.e. twisted slightly to combine with other fibres to make one thread. This yarn is woven into silk goods. Satins are woven with only weft threads showing on the right side, thus giving a uniform glossy surface. Velvets are made by passing warp threads over fine wires which, when withdrawn, leave a short, soft "pile." Tussore silk from Assam, and Pongee silk from China are originally fawn-coloured silks made from the "wild" silk, the thread of which is too heavy for reeling. Silks are also mixed with cotton for cheaper fabrics.

China has the largest yield, but Japan has a greater export trade. Japan provides about half the world's supply of raw silk. China, Italy, the Levant and France are the next most productive countries. Silk is manufactured into goods in all the silk growing countries, and especially in France, Germany, Italy and Switzerland. Silk is the principal fabric for clothing in China and Japan.

The British manufacture of "thrown" silk is very small, but considerable quantities of "wild" silk are imported for "spun" silk, which is spun like cotton, and used in Lancashire, Yorkshire,

Essex, Nottingham, etc , for lace, hosiery, velvets, plushes, etc  
The USA has a vast silk industry, mainly at Paterson (New Jersey)  
Two-thirds of the world's supply of silk is taken by U S A



FIG 149—SORTING SILK COCOONS AT ANTIOCH, SYRIA

**Artificial Silk**, a chemical product for the textile industry, has become so important in recent years as seriously to rival the trade in pure silk There is an increasing demand for this article, which

can be put to the same uses as natural silk, but it is much cheaper. Artificial silks are all manufactured from some form of cellulose, chiefly cotton-waste, though they are also made from sawdust and other wood fibres. The method in each case is to reduce the material to a "jelly" similar to the substance from which the silk-worm spins the cocoon. This jelly is then forced through exceedingly fine glass tubes, so fine, in fact, that twenty such filaments are used for one thread of "silk". The chief supplies of artificial silk come from U.S.A., Great Britain and Germany.

**Flax** It is certain that the flax plant was cultivated in very early times for linen fabrics, thread, and stores of linseed have been found in Stone Age excavations. The herb is grown for the production of two useful materials, the seeds and the fibre. If grown in hot regions, the seeds are of value, but if flax is cultivated in cool areas, it is the fibre which is required. The seeds exported from India and Argentina are crushed to obtain linseed oil. The fibre is obtained from the inner bark or *bast* of the stems of plants grown in cool and fairly wet parts of the temperate zone. Almost all of the flax fibre is grown in Europe—Russia, Poland, and the Baltic countries of Lithuania, Latvia, and Estonia produce the largest quantities.

To remove the seeds, the stems are combed or *rippled* by hand or machine. The next process is *retting*, which consists of soaking the straw in water until the gummy matter is dissolved. After retting, the straw is dried and *broken* by heavy rollers to break up the woody core which is removed by beating or *scutching*.

In the United Kingdom, Belfast, Canterbury and Dunfermline make the finest linens, Barnsley, Dundee and the coast towns of Forfar and Fife make coarser fabrics. Cambrai, in N.E. France, makes the world's best linen, the Belgian towns use coarser flax. Linen goods are also largely made in Holland, Germany, Switzerland and Czechoslovakia.

**Hemp** is a trade name for textile fibres produced from the stems of several distinct species of plants. The fibre yielded from the inner bark of the plant is similar to flax, only coarser and stronger. Like flax, it can be grown over a wide range of climate, and is produced in almost the same countries. The process of manufacture is similar to that of flax. Russia is the chief source of supply, but the Philippines produce the fine Manila hemp, and Italy and India are noted for their production. Hemp fibre is manufactured into rope, string, sack-ing, conveyer-belts, sailcloth, tarpauline and fire hose. Dundee in Scotland is engaged in the manufacture of these goods. The seed of the plant is crushed to obtain hempseed oil.

A special variety of hemp, called sisal hemp, comes from a plant of the agave family, the fibres of which are used for making mats, ropes, sailcloth, etc. The fibre is exported from Sisal in Yucatan (Central America) hence its name. Mexico produces about three-quarters of the world's supply, but it is also largely grown in tropical S. Africa. Tanganyika sisal is the best in quality.

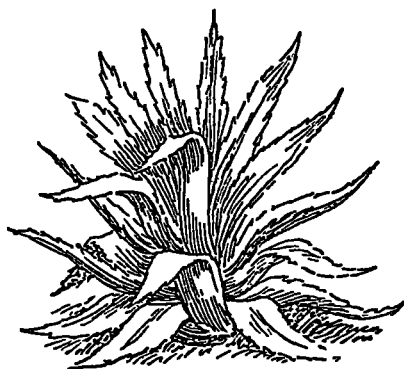


FIG. 150—SISAL HEMP

**Jute** is a tropical plant needing great heat and abundant moisture. The great area for its cultivation is the Ganges valley, particularly near the delta area. Flooding of the district in which it is grown is beneficial, except in the early stages. The plants are from 5 to 3 feet in height, and the fibre occurs as *bast* just beneath the bark. It is more woody than flax or hemp, so is suitable for the manufacture of bags, sacks, packing canvas, cheap tapestries, stair



carpets, cart covers, school bags, backings and linings. The fibre is obtained from the stem of the plant in a manner somewhat similar to that adopted for flax and hemp.

About half the crop of jute is manufactured into *gunny cloth* at the Calcutta mills. Gunny is a general name for all jute cloth, but it is usually given to the heavy sacking used for grain bags. The remainder of the crop is chiefly exported to Dundee, Barnsley, in Yorkshire, has considerable jute manufactures.

Oils may be classified as mineral, vegetable and animal. Petroleum is the important mineral oil and, from it, numerous products, having a variety of uses, are manufactured.

Vegetable oils are obtained from a large number of seeds and fruits of plants, particularly the seeds of the flax, hemp, and cotton plants, and the fruits of the oil palm, coconut palm, olive and castor oil plants, soya beans and ground nuts.

Animal oils are obtained mainly from the whale, seal and cod.

Oils are put to a number of uses, including power, illumination, lubrication, table use, and the manufacture of soap, margarine and paint.

The chief sources of petroleum and vegetable oils have already been noted in various parts of the book. Whale oil is the most valuable and important of animal oils. These *train oils* as they are mostly called, come from the *blubber* or fat under the skin. This fat lies in layers up to two feet in thickness, and a large whale may yield 30 tons of blubber. Whales are mammals of fish-like form adapted to life in the oceans. The thick layer of fat maintains the high temperature of the blood. Whale "fishing," as it is called, is now mainly carried on in the southern seas. South Georgia (U.S.A.) is the most important base of the industry. The sperm whale, which lives in warm seas, has comparatively little blubber, but it is hunted for sperm oil which is obtained from a great cavity in the head. Train oil is mostly used in the manufacture of soap, but sperm oil

yields a waxy substance called spermaceti, which is used in making cosmetics, candles, etc

Gold is chiefly found in veins of quartz, or as *placer* gold in the gravels and sands of streams, as the result of the weathering of gold-bearing rocks Large grains or flakes of placer gold are called



FIG 151 —PROSPECTING FOR GOLD IN VICTORIA

nuggets Placer gold is obtained as nuggets or as fine dust by washing away sand and gravel Vein gold is *stamped* or crushed by powerful machines, and the gold is recovered by chemical processes The richest deposits contain 4 5 ozs of pure gold per ton of rock

As a rule, wherever gold has been found the great rush of prospectors has led to conquest or exploration, with the resulting development of lands which might otherwise have remained neglected The great *gold rushes* to Australia in 1851, and to S

Africa in 1882, and to Yukon in 1896 have been the cause of rapid development of those areas. Nearly one-third of the world's supply of gold comes from the Transvaal in S Africa. Rising from a plateau, nearly 6,000 feet above sea level, is a ridge of low hills, known as the Witwatersrand, or *ridge of white waters*. This ridge, or *rand*, is famous now, not for its white waters but for its gold. Running through this ridge is a vein of rocks containing gold. In some places it is only a few hundred feet below the earth, but in other, it is several thousand feet. It stretches for sixty miles, like a golden thread carelessly drawn through the rocks, and this is the greatest deposit of gold known in the world. In the centre, where the first shafts were sunk, stands the *Golden City* of the Rand, **Johannesburg**.

Johannesburg is a beautiful city with many fine houses, wide streets, orchards and gardens. The only drab part is the mining area, where are long rows of corrugated iron buildings in which the miners live.

The second largest supply of gold comes from Russia, where the yield is a little more than one-half of that from the Transvaal. Canada and U.S.A. supply about equal amounts.

Other important goldfields are in Western Australia, mainly at Bendigo in Victoria, and in the semi-desert region about East Coolgardie, in the Klondike region of Yukon (N.W. Canada), Kootenay in British Columbia, and Porcupine in Ontario.

The world's total production of gold is 35,000,000 ounces, of which the British Commonwealth yields about 55 per cent.

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